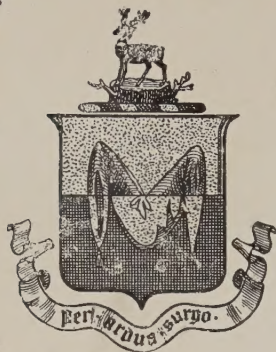


MAN AND CIVILIZATION

JOHN STORCK



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MAN AND CIVILIZATION

AN INQUIRY INTO THE BASES
OF CONTEMPORARY LIFE

BY

JOHN STORCK

INSTRUCTOR IN PHILOSOPHY
COLUMBIA UNIVERSITY

THIRD REVISED EDITION



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PREFACE

In this book I have tried to present a non-technical yet sufficiently dignified interpretation of human activity in fundamental agreement with the results of recent study in the fields of psychology, anthropology, and sociology. These disciplines, of course, are still in their infancy, and so it is impossible to tell what light they may eventually throw on human affairs; but they do offer intelligent people of today certain leading principles and a considerable array of specific data (still rather scattered and fragmentary, it is true) that can help them to a better understanding of contemporary life and its problems.

Preliminary editions of the book were used during the last two years as required reading in the prescribed freshman course in Contemporary Civilization which is given in Columbia College. I have benefited greatly from the advice and criticism of the students and teachers who have participated in the enterprises of that course, and many other friends have been kind enough to offer suggestions for the improvement of the book. In particular I wish to acknowledge an overwhelming indebtedness to Professor J. J. Coss, Maurice Goldbloom, Malcolm Stuart McComb, Mark Louis Potter, Florence Elsey Storck, and Edward Treacy. These persons treated the book as if it were their own, and lavished upon it every care; where it is at fault, in many cases, no doubt, it is because I failed to take their advice. Many other persons have helped in only slighter degree.

The numbered references to be found in the body of the book refer to the bibliographical notes that have been gathered together at the end of each chapter. In general, mention of a book or article in these bibliographies may be taken as a hearty recommendation of it to the interested reader, as I have tried to include only the best things I have come upon in the course of my reading.

J. S.

September, 1927

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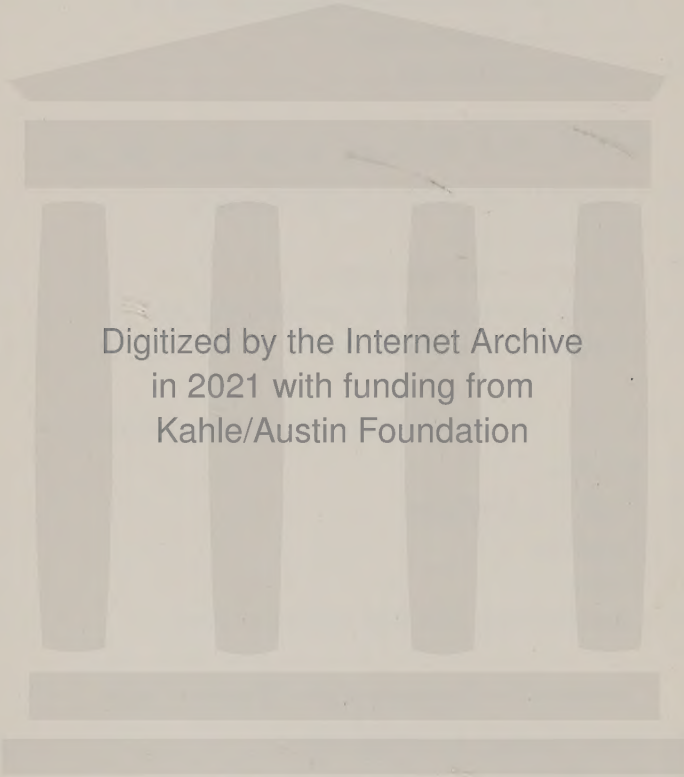
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PART I
THE WORLD WE LIVE IN

Chapter I

THE SOCIO-BIOLOGICAL VIEW OF HUMAN NATURE

Fundamental characteristics of living things

The romantic story of evolution has many plots, but perhaps the most interesting of them all tells of the unbroken web of life. All living things without exception are bound by living ties to the past, first of their own kind, and then through them to yet other kinds, back—far back—until the record is lost in the misty dimness of time. When and where life first appeared on our planet this story does not say; did our earliest progenitors arise from the sea an eon or two ago, under the favoring ministrations of that equable environment, or were they spawned in the heavy airs of some more distant geological age? The past offers no settled answer. It is possible that life has had several distinct beginnings, either at one time or at different times, and dead matter may even now be exploding into life in some corner or other of the cosmos.

Be this as it may, the unfailing continuity of life becomes most impressive when we trace the stream backwards from the present. The very fact that any one of us is alive today proves conclusively that in one instance there has never been a break in the chain. Indeed, the almost numberless matings between living creatures that fill the past make it extremely probable that we are all members of one great family, even if we do not all come from the same ultimate parents. Speaking broadly, then, we may expect the basic birthright of all life to be identical.

Let us examine this common inheritance by asking ourselves what description would apply equally to a man, a rosebush, an elephant, a worm, and a diphtheria germ. Biologists name the following properties or traits as characteristic of organisms or living things:¹

(1) *Cellular organization.* Plants and animals of every

kind are composed of highly complex organic compounds,* which form the constituents of "protoplasm." Protoplasm

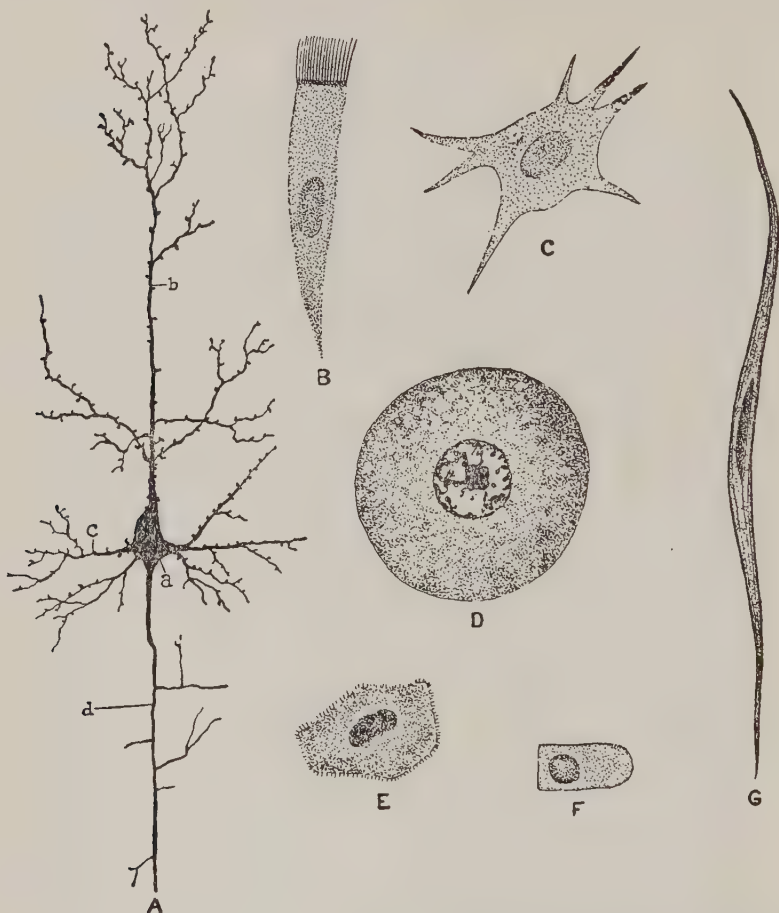


FIG. 1. Various types of cells. A, nerve cell from human cortex; B, epithelial cell from trachea; C, connective tissue cell from rabbit; D, human ovum; E, epithelial cell from human epidermis; F, columnar epithelial cell; G, smooth muscle cell. (From Bailey, *Text-book of Histology*, 7 ed., N. Y., William Wood and Co., 1925, p. 5.)

differs in its specific constitution in different species, and even within the same species; but in all organisms it combines

* *I. e.*, compounds whose indispensable component is carbon in association with oxygen, hydrogen, and nitrogen—and also less frequently with other elements.

to form *cells*. These are the smallest units of living matter (Fig. 1). While many plants and animals are single-celled, more complex organisms are composed of colonies or aggregations of many cells in varying degrees of association, different groups of the member cells being specialized to perform specific functions. Thus it has been estimated that the cortex or thin outer coating of the human brain contains

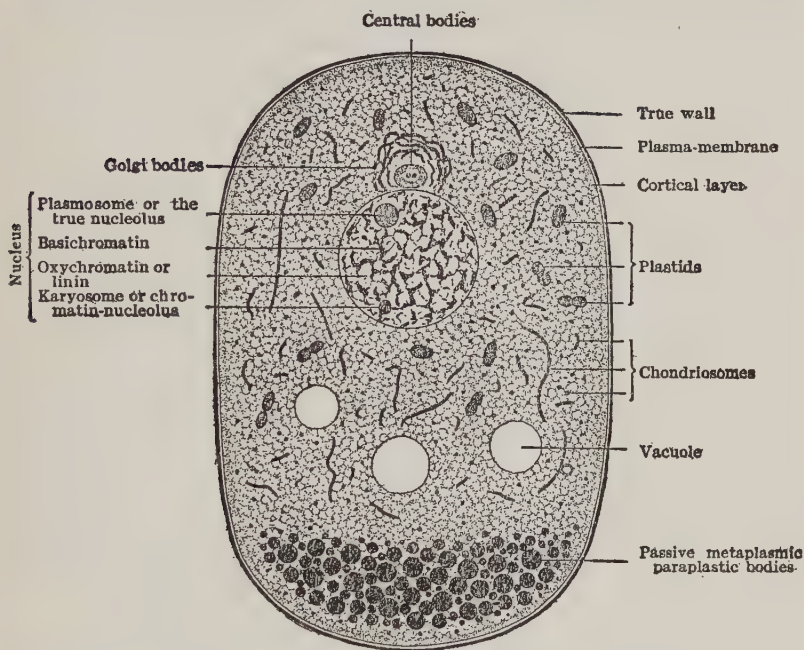


FIG. 2. General schematic diagram of a cell. (From Wilson, *The Cell in Development and Heredity*, 3 ed., N. Y., Macmillan, 1925. Reprinted by permission.)

considerably over nine billion nerve cells, in addition to many cells of other types. The behavior of the organism depends on the manner in which these nerve cells act upon each other and upon the other cells of which the organism is composed. The human being, like all complex organisms, is a great interacting society of living creatures functioning in different degrees of dependence on each other. But as a matter of fact, even the simplest single cell is an intricate organism composed of interfunctioning parts (Fig. 2).

(2) *Metabolism*. The living state is one of continuous chemical activity. Every organism keeps itself alive by taking in and assimilating combustible materials from outside itself; by oxidizing or breaking down these materials, thus releasing their stored up energies; and by excreting the broken down compounds as waste products. The more complex organisms possess a fairly permanent structure which is built up from part of the assimilated material. The metabolic needs of an organism are always fairly specific, and are also regularly recurrent. Hence each organism is bound rather closely to those natural environments which are capable of satisfying these needs.

(3) *Reproduction*. Organisms under certain conditions and at certain times are capable of "reproducing themselves," that is, of producing new individuals more or less like themselves. The basic feature of all reproductive processes is cell division—the operation whereby one cell becomes a number of cells. This process is a complicated one in which the structure of the original cell is altered at the time of division so that complete cells are formed of the parts split off. Thus when the one celled ameba by dividing literally becomes its own children, it does not simply fall in two. The new generation comes into being as a result of complex physiological changes in the course of which the specialized parts of the parent animal perform precise functions. In the case of human beings, the processes of cell division which lead to the development and birth of a child are brought about by the fertilization of a female germ cell (or ovum) by a male germ cell (or spermatozoön) within the body of the female.

(4) *Irritability and motility*. Every organism is intimately and continuously responsive to the energies which incessantly play upon it, and in turn the organism continuously acts upon the environment. The different parts of the organism also act upon each other without rest or ceasing, and as a result of all these actions and reactions the organism is changed and changes other things in a never ending sequence. This continuous external-internal interplay is no doubt an aspect of the fundamental instability of proto-

plasm, but it is also an integral feature of the dynamic world to which organisms belong. This interplay of external and internal forces determines what the organism *is* and what it *does*. When we investigate the changes that take place within the living creature itself during the process, our concern is with the *irritability* (or sensitivity) of the organism; when we study the external motions or actions that result, we are interested in the organism's *motility*. In both cases we are dealing with essentially the same process, though from different points of view. The first interest might be called biographical or personal, the second historical or behavioristic.

The place of birth in the life process

The organism does not wait until it has been born to begin functioning. The intimate interdependence between biological and environmental factors long predates the moment of birth. This fact is ignored when attempts are made to distinguish inherited from acquired traits by determining the traits which are present at the time of birth. Birth in no sense constitutes the beginning of life processes—*i.e.*, of biological-environmental interplays. The child was alive for nine months prior to the time of its coming into the world, and the germinal materials from which it developed were alive before that. Life comes, through germ cells furnished by the parents, from a dateless past. Nor can the real beginning of an independent existence be dated from the moment of birth. The baby, the child, and even the adult are at all times dependent on persons and things outside themselves for the realization of their own natures and even for their very existence. Nor does the infant display at birth anything but the vaguest intimations of personality and character. To start with, he is hardly more than the insistent embodiment of certain needs; and precisely what he shall eventually become depends as much on how these needs are satisfied as on the nature of the needs themselves.

Children do not come "out of the nowhere into the here" by sudden and impersonal fiat; they are born as a result

of complex socio-biological interactions between organisms. The process by which children are conceived, formed, and brought into the world is biological and social in all of its phases. It is biological because it goes on at every point in terms of the primary life processes described in the preceding section; and it is social because it is affected throughout by the attitudes and behaviors of persons who function as coöperating members of a group. Birth initiates new physiological rhythms (respiration, feeding, etc.), but these activities assume and require the new environment (itself social as well as merely physical) into which the organism is thrust. In addition the organism acquires a new social status upon being born. The time is one of alteration and therefore of danger, but in this respect it does not differ significantly from other periods in the life history of the organism—as, for instance, (1) the moment of fertilization, (2) the first three or four years of life, or (3) the period of adolescence which begins early in the second life decade. Although these foci of change will be discussed at greater length in the pages that follow, a few words concerning each of them at this point are appropriate in order to show that the changes incident to birth are paralleled in the history of the organism by other changes of quite equal importance.

(1) At the moment of fertilization, when male and female germ cells unite and initiate the processes of cell division which finally result in the development of a full-fledged human being, the main hereditary outlines of the individual's equipment are laid down—in no detailed and arbitrary manner independently of all further eventualities, as we shall see, but within limits nevertheless. (2) During the first three or four years of life, including the period of nine months in the womb and the years that follow, the organism comes more closely and pervasively under the influence of its physical and social environment than during any succeeding period, and that too at a time when its weakness, immaturity, and ignorance render it exceedingly susceptible to outside pressures and influences. During the time it spends in the even environment of the womb, the broad outlines of its bodily structure are determined, and the basis

laid for many of the behavior patterns of later life.* Nor are the first years after birth less important, for it is then that children form those drives towards mastery or submission, those curiosities, apathies, interests, and aversions, those habits of cleanliness, carefulness, and attention (or their opposites), and those countless other traits and behaviors which so often last them through the years and mark them off as distinct from other persons until their dying day. (3) During adolescence the life régime of the individual is almost completely reorganized. The sex organs mature, and their secretions initiate physiological changes which transform the child into a fully sexed human being. The bodily attributes of sexual maturity are disclosed, the individual becomes capable of reproduction, new and often disturbing interests in members of the opposite sex appear, vague but powerful romantic yearnings are often experienced, and the pace of life is quickened and its poignancy increased.

Interfunctioning of physical, biological, and social factors

The life processes of human beings may be studied from many different points of view, as is shown by the existence of the sciences and arts which deal with one phase or another of human behavior. It is essential to remember, however, that concrete human living is not ordered in exact accordance with the abstract principles of any of these disciplines.†

*By a behavior pattern is meant some specific organization of response, as the thrusting out of the arms when one has stumbled, or the motions one goes through in signing one's name. The number of behavior patterns displayed even by simple organisms is very large.

†Physiology, psychology, biology, anthropology, sociology, etc. (as their names imply) are really logical systems—i. e., they present theorems (in the form of "facts" and "principles") which flow from basic assumptions or postulates entertained largely for the sake of their organizing power. These assumptions appear in the systems as: (1) definitions; (2) methodological procedures—accredited ways of experimenting, presenting data, etc.; (3) notions of relevance and cogency—accredited canons for the inclusion and exclusion of data. Logicians hold that one or more undefined terms are also necessary to constitute a logical system.

This section must not be read as a polemic against logical systems of the kind described. It is rather a plea for a more comprehensive system from which theorems will flow whose point of reference is "John Doe" rather than "Nature," "Man," "Mind," "Society," etc.

Living is a confused thing at best, and a thorough understanding either of human nature or of social phenomena is hardly possible until some phases of the actual interfunctioning of the forces analytically studied by the various human sciences has been mastered. Hence this section, in which (1) the constitution of the germ plasm, (2) organic needs, and (3) social continuity are discussed in order to exhibit a few of the interconnections empirically exhibited by "physical," "biological," and "sociological" factors.

(1) *The constitution of the germ plasm.* According to contemporary biological theory, the direct line of biological connection between parents and children is through the germ cells of the parents. The assemblage of traits which the child receives from his parents—*i.e.*, his heredity—is held to be determined by the precise constitution of the germinal materials which they contribute to his being. Into the nature and extent of this determination we must now inquire.

It has been established that germ cells carry within their nuclei minute material particles, and that these particles (which are usually called "determiners") in some as yet unknown manner affect the course of biological development. Whether two germ cells ever contain exactly the same complement of determiners is not known; but it seems beyond question that the general make-up of the germ plasm as respects determiners differs very widely from person to person, if not from germ cell to germ cell within the same person. The specific heredity of an individual, then, depends on the nature of the germinal materials furnished by its parents, and on the manner in which these materials combine at the moment of fertilization. The determiners act upon each other according to laws whose nature was first indicated by studies made on the common vegetable pea by Gregor Mendel, an Austrian monk; and the science of biology was entirely revolutionized as a result of the discovery of his work in 1900, after it had lain fallow for thirty-five years in an obscure scientific periodical.² While no description of the complicated processes involved need be offered here, the following observations are pertinent to

the point in hand: (a) all bodily traits exhibited by an individual (as for instance the color of his eyes, shape of his nose, length of his fingers, etc.) apparently possess an indispensable biological basis in determiners (or groups of determiners) derived from the germ plasm of one or both parents; (b) determiners corresponding to each bodily trait exhibited by an individual must be present in the germ cells which eventually mature within the body of that individual, though *all* of the determiners responsible for *all* of the bodily traits will seldom if ever be present in any single germ cell; (c) determiners for other traits than those exhibited in the body of the individual will also be present in his germ cells when they finally mature, and under appropriate conditions may therefore be inherited; (d) for reasons that remain obscure, from time to time there appear in the germ plasm new determiners (or combinations of determiners) capable of yielding new inheritable traits. These new traits are called mutations.

To the contemporary biologist the line of hereditary descent is from germ cell to germ cell, each fertilized ovum eventually producing new germ cells whose nature is almost completely unaffected by what happens to all the other cells in the course of their development.* Or, to answer the old question about the chicken and the egg, the egg comes first, and produces both the chicken and additional eggs, which have in turn the power of producing yet other chickens and eggs. The chicken, as Samuel Butler was fond of putting it, is only an egg's way of making other eggs. From the biological point of view it is often legitimate to regard the body as merely the carrier of the germ plasm.

Heredity is often erroneously conceived of as furnishing the raw materials of growth and development. These processes, however, as we have seen, are metabolic; growth does not come about through the mere expansion of already existing structures, but through the intake and assimilation of

* The discontinuity between the germ cells and the body is not absolute, since certain conditions in one or both of the parents (as alcoholism or syphilis) are capable of affecting the germ plasm. In addition, evidence of varying degrees of authenticity is accumulating in favor of the inheritance of acquired characters in certain very specific instances.³

materials furnished by the environment. The world is thus *built into* the developing organism, while at the same time the organism is built into the world. The structure and functioning of a developed human being is as much an expression of "outside" physical and social forces as it is of "inside" hereditary and organic conditions. Heredity may be regarded as furnishing the limits within which individual development, as elicited by the social and physical environment, takes place. No study yet made, however, has disclosed the exact limit of biological capacity of any individual with respect to any single trait. As a matter of fact, no satisfactory enumeration of distinct biological traits seems possible at the present time so far at least as the human being is concerned. An increasing body of evidence tends to show that the germ plasm does not contain single simple determiners which press relentlessly on to the development of specific bodily traits, provided the environmental conditions be favorable; but rather that these traits are caused by the coworking of comparatively large numbers of determiners under the precise environmental conditions present at the time when the traits in question begin to appear. Under different conditions the same set of biological determiners would produce a different individual.⁴ It is clearly unwise, therefore, to regard heredity as an entity or force when it is taken in abstraction from a supporting and eliciting environment.

From the above it appears that the environment is effective in helping to determine the direction of biological development. Is the constitution of the germ plasm itself ever altered by environmental pressures? This is a very different question. Modern biologists practically without exception have held that the germ plasm lives its own life in an almost complete (if not splendid) isolation, and that its nature remains unchanged, or almost entirely so, irrespective of the life history of the individual in whom it resides. A group of individuals, from the biological point of view, might rather be considered as an aggregate of germ plasms incidentally carried in separate persons than as a collection of persons. The persons may be what they are largely or

even entirely because of environmental influences (these biologists would say), but the germinal materials they carry within their bodies are quite beyond the reach of external influences.

It is not necessary to assume that the physical and social environment has a direct influence on the germ plasm in order to show that biological "determiners," no less than the bodies in which they are found, are responsive to environmental pressures. The group is able to affect the germ plasm indirectly, by processes of selection. Any social activity which picks its participants will turn the trick, provided the selected group also shows a higher or a lower birth rate than the average for the time and place. For, as we have seen, the presence of bodily traits in the members of a group is an index to the presence of germinal determiners in the germ plasm of the members of that group; and a higher or lower birth rate for that group will therefore tend, if the environmental situation remains constant, to perpetuate or to destroy the group, with its germinal determiners.

Many social arrangements have precisely this effect. Perhaps the most obvious instances are to be found where persons belonging to certain restricted groups are either discouraged or prohibited from having children. Members of religious orders in many societies are in this position, as are teachers in our own culture. Alterations in the constitution of the germ plasm of a group are also achieved whenever a selected, group of persons is subjected to an unusually high death rate during the years when its members are still biologically fertile. This happens in our society in the case of those who go to war, as likewise with respect to those who live in unfavorable social environments or engage in dangerous occupations.

The cases cited by no means exhaust the instances where the social environment indirectly determines the biological constitution of the group. The selection of bodily traits among the young when at all severe inevitably means the selection of germ plasm, since the traits which make their appearance in the body, and are selected, also go to make up the determiners in the germ plasm (together, of course, with

those traits which according to the laws of heredity fail to appear in the body). And the group is continually engaged in this process of selection, according to canons and standards which differ widely from place to place. Rules and understandings always exist which determine how groups and individuals shall come to meet each other; who shall marry whom, and under what conditions; how many children there shall be, and at what times in the parents' life cycles; which children shall be favored, and in what ways; etc. Who shall be born and who shall live and come to maturity, and under what conditions, are thus not pure questions of biology. These matters also depend on the prevailing social arrangements, and on the ideas current in the group at any given time. The infant is not only born helpless and immature into a social group. In a very real sense he is born of the group. He is *its* child quite as truly as he is the child of his parents.

We are beginning to see that the chief biological difference between the germ plasm and the body is that the former includes within itself the possibility of a considerable number of traits not actually displayed in the body. This means that every new generation offers a new deal, so that it is really in part possible for the group to decide whether the new hand shall be played in the same old way. Neither the individual nor the group, however, has done much up to the present so far as the conscious and deliberate selection of biological traits to be exhibited by the coming generation is concerned. It is to be doubted whether we possess sufficient detailed information at the present time to carry out any extensive program of eugenics, or efforts to improve our biological stock. In breeding out traits which were regarded as undesirable, as, for example, certain neurotic tendencies, we might find ourselves committed to the extinction of other associated qualities of great social importance, as perhaps some kinds of artistic ability. No very positive measures seem feasible in the present state of our knowledge. At the same time, some students of the subject have suggested that the human stock might be improved by discouraging childbearing among: (a) the feeble-minded and others of less intelligence; (b) the

victims of hereditarily transmissible diseases (including mental and venereal diseases and alcoholism); (c) those subject to severe congenital defects of vision, hearing, and speech. Any eugenics program would have to be administered with greater care than it would be likely to receive, however, lest it result in more harm than good to the race.

(2) *Organic needs.* The human organism has its beginning when, through the union of the sexes, a fertilized germ cell begins the long and complex process of cell division which finally results in the finished human product. This process is not completed at birth. It leads to the progressive specialization of cells as to structure and function, until eventually the entire assemblage of muscle, nerve, gland, bone, blood, germ, connective and other cells has put in its appearance, and the different parts of the body have assumed their characteristic general relations to each other. If the human organism were tremendously enlarged, we could see each of these cells separately functioning as a living being with about the same degree of independence of other cells that individuals show when they are engaged in a variety of more or less similar tasks requiring different degrees of coöperation.

The various parts of the developed organism are arranged in a number of partly coöordinated systems. Each of these systems is in part independent and performs its own peculiar functions, while at the same time it remains in more or less close association with the other systems, and continually acts in concert with them in any one of a large number of ways. The organism is therefore a rather loose aggregate of interacting parts or systems, among which may be named the respiratory, circulatory, digestive and excretory, glandular (including sexual), and nervous (or neuromuscular) systems. That these systems to a considerable degree depend on each other is shown by the fact that they seldom function separately and alone. At the same time complete coöordination is never realized, for although many coöordinations not present at birth are established later on, the process is never carried very far in proportion to the possibilities, and disturbances of existing coöordinations are also continually

taking place. Among the many coördinations that are achieved are all of the manifold instances of learning; while among the numerous disturbances of existing coördinations are such things as nervous indigestion, where the ability of the stomach and intestines to digest food and excrete waste is affected by changes in the nervous system brought about by psychological maladjustments.

An organic need may be defined as anything requisite to the functioning of a biological system, either when it is working in comparative isolation or in intimate association with other systems.

The interfunctioning of parts characteristic of living things cannot continue for any length of time without the support and assistance of external materials and energies, since the activities involved in these interactions (as we have seen), are not purely organic, but must cross and recross at nearly every moment the membranes and other boundaries which after a fashion serve to separate the organism from its environment. If, therefore, the organism is to remain alive and functioning, the environment must not fail to provide whatever may be necessary for the maintenance of its activities.

The various parts of the organism are capable of functioning without trouble and friction only when their organic needs are satisfied within certain rather fixed limits. Thus the respiratory system needs air, but, more than this, it needs air of a particular quality in stated quantities at fixed intervals, and disturbances of function of one sort or another are certain to occur whenever the supply is diminished or adulterated. Elaborate ventilation devices are installed in public buildings to insure an uninterrupted supply of good air; and the gaseous and solid impurities poured into the atmosphere of a great city cannot fail to affect the health and well-being of its inhabitants. Thus Kelsey reports that the smoke emitted from Pittsburgh industrial plants contains about three million tons of sulphur yearly, or enough to dissolve 265,000 tons of iron, and that soot is deposited each year in central London at the rate of 426 tons per square mile.⁵

The organic needs of a human being are many and various. Although they are obliquely dealt with in connection with the study of physiology, no investigator seems to have undertaken the difficult task of listing, describing, and classifying them. The extent to which organic needs are met in any group is of the first importance in determining the primary life satisfactions open to members of that group. While no living arrangements can utterly disregard these needs and long endure, a certain margin of maladaptation is possible and perhaps inevitable under the conditions of human life. Thus although there are constant pressures towards some degree of correspondence between these life needs and the activities of the group, the adaptation is never very exact, and usually falls far short of what one might desire.

The pressures tending to make organic needs and group activities correspond do not work, however, in but one direction. Group behaviors often have the effect of defining the precise nature of organic needs. Among the basic human needs, for example, men rightly include exercise and rest. Unless the muscles are frequently brought into vigorous play, the blood sent coursing through the veins, and the general level of bodily tonus heightened, we become flabby and soft in all our parts. Unless, on the other hand, we are able periodically to loll about and invite our souls while the body rebuilds the structures that have been torn down under even the normal strains of life, we become restless and enervated. The character of this need for exercise and rest, however, has not remained unchanged throughout the course of human history. Who ever heard of a primitive man exercising for the sake of the exercise itself? Yet this is precisely what contemporary city dwellers find it necessary to do. The need for exercise has become crucial in their lives. Graham Wallas has pointed out how the conditions of modern life have elicited not only new forms of fatigue and new susceptibilities to it, but also new capacities for work and effort.⁶

This same matter of work and play may be used to illustrate the curious inversions and adaptations among our activities that may occur without fatally transgressing biolog-

ical law. Activities may become tied up with the satisfaction of needs which at first glance hardly seem pertinent to them. Work is usually regarded as the expending of strength or thought for the attainment of an external end; whereas play is taken to mean activity engaged in for its own sake. Americans, however, are often accused of turning their play into work. Instead of pleasurably luxuriating in a loose and rather random release of energies when they play their games, the desire for mastery and success (both of which are socially generated urges external to the actual activities involved) pushes them on to the most strenuous exertions. Through laborious practice and great hardships they become exceedingly proficient, but only at the cost of turning their games into businesses requiring unremitting application. In order to husband their energies such persons are forced to treat their "work" as play. Some rather remarkable features of American college life are here in point. Many students really do all their work on the athletic fields or in other extracurricular activities, and merely play their way through their studies. The former activities have become the accredited channels of intense endeavor, and the classroom becomes a place for day dreaming, idle speculation, mild surmise, and general intellectual looseness. The situation is not an entirely happy one, since the games really seem better adapted than the classroom to the purposes of play. Whether the classroom is really adapted to the purposes of work is, of course, another question.

It is often desirable to distinguish organic needs with pronounced social components from those which remain relatively unchanged from one environment to another. This we may do by calling the former developed or derivative needs. Needs of both types should also be distinguished from things which are merely desired, since it is obvious that a thing may be desired (or wanted) although it is neither an organic nor a derivative need, as these terms have been defined above. Thus a little child may beg for more candy, although (as we say) "It isn't good for him." Whether all organic needs are good for us is a delicate question that can hardly be answered in the present state of our knowledge;

but it is certainly possible for a derived need to be biologically harmful—as for example the socially developed need for certain stimulants.

(3) *Social continuity.* From the very beginning we are immersed in a world which is not of our own making. It is an organized world of persons and things, disposed in certain fairly fixed relations to each other and arranged in a great diversity of patterns. But little study and reflection are required to demonstrate that these social relations and patterns have had a history, that few of them are of recent origin, and that all of them could not possibly have originated at the same time and under the same conditions. Into this world which perpetuates and enshrines elements from so many different pasts we must fit ourselves, and in doing so we are brought under the influence of an immense social heritage.

It would be difficult indeed to overestimate the range and diversity of this social heritage in the case of even the simplest culture. Nor is it easy to exaggerate the subtlety with which the social forms insinuate themselves into the recesses of our lives. We live and move and have our being within their confines. Gradually and painlessly (for the most part) they become woven into our lives, until our most private natures become indistinguishable from their patterns. If at times we feel moved to disown the social inheritance, we know not whither to turn, for in denying it we should be forced to renounce ourselves. To grow up in and absorb a way of life is to be created in its image. Minor changes and innovations of no great significance are of common occurrence in every group, but such things have little effect in altering the steady social pressures under which men live. Only to the extraordinarily gifted, or to the extraordinarily lucky, is it given to break even a few of the bonds which bind men to their group—the gifted man may now and then by sheer power carve out some new thing, the lucky man may now and then by fool's right stumble on what was hid.

That social factors are absolutely indispensable in the formation of developed human beings is strikingly shown by the pitiful stories of presumably normal individuals who for one reason or another have grown up since infancy in isola-

tion from their fellows. These persons have usually impressed those who observed them as being more like animals or idiots than like normal human beings. They have commonly proved almost uneducable, and most of them have rapidly pined away under the strange pressures of social life.⁷

The problem of "original nature"

The prevailing view of human nature asserts that every human being shows, either at birth or at some time thereafter, and independently of specific environmental influences, a certain array of fairly complex pattern responses which are usually called instincts. It is claimed that these responses are nothing more than a development or flowering of the hereditary materials to be found in the fertilized germ cell, and that there are imbedded in them no ingredients from outside sources. The environment is admitted to be necessary to the appearance of these responses in but two ways: (1) it furnishes the general setting and background for them, in somewhat the same manner that a theater stage is used by actors in giving a play; (2) it furnishes the initial stimulus which sets them off, somewhat as a match might start a fire.

Psychologists have made many attempts to list and describe these inherited pattern responses. The confusion engendered in a candid mind by an inspection of their efforts is appalling. It is fairly easy to demonstrate the presence, prior to all training, of a few of an apparently large number (running probably up into the hundreds of thousands) of very simple activities, such as sneezing, crying, urination, eye, head, hand, arm, trunk, leg, foot, and toe movements, feeding responses, grasping, breathing, etc.⁸ But these activities are far too simple, specific, and prosaic to receive consideration as instincts, and they are usually called reflexes. The term instinct is intended to apply to more pretentious actions of some obvious social significance; typical examples are curiosity, motherliness, gregariousness, display, shyness, pugnacity, manipulation, play, self-preservation, mastery, etc.⁹ It would seem as though these "instincts" were clearly learned responses, something developed

out of and as a result of experience. The character of the response in each instance differs enormously from person to person and from group to group; the response is not merely set off by the stimulus, but the stimulus accompanies, maintains, and directs the response; and whole environmental structures are implied and required to make the response possible.

With respect to the simpler reflexes the situation is somewhat different. Jennings has recently suggested that these too are really learned responses, and that the environment in which these habits were put on is that of the womb:¹⁰

In the group of organisms to which man belongs there is an early period in which it is practically difficult to change effectively the conditions under which the organism develops, because it is enclosed within the mother's body, or within a resistant eggshell. So we have gotten accustomed to calling inherited those characteristics which are determined before it leaves its mother's body or the egg, while those determined later are called acquired characters. But this is an artificial distinction, based on practical considerations.

The doctrine of instincts in its contemporary forms presents a very inadequate picture of the complexity of our biological life, and in addition it fails to give due place to the environmental factors (physical and social) which affect even the simplest of human actions. If there are any such complex unlearned elements of human behavior, they have as yet resisted discovery. The way to find them, if they do actually exist, would seem to be through the painstaking analysis of large masses of anthropological data, and through the careful study of the simpler reflexes. Out of such investigations there may eventually emerge more convincing evidence for the existence of fairly complex innate behavior patterns of direct social significance than is at present available.

General characteristics of human behavior

This chapter will now be concluded with a brief consideration of the human organism as a functioning unit. Like

most of the animals, man is built on a generally symmetrical plan, a fact of very great importance in determining how he acts. He differs structurally from all other animals in his upright posture, in the possession of extremely flexible hands (his first and most important tools), of a delicate apparatus for the production of sounds, and of a still more finely equilibrated brain and nervous system.* His behavior exhibits great plasticity, as is evidenced by his long period of infancy and immaturity, and by the width of his span of attention and interest. He is unique in the degree to which he can respond to signs—witness his many different systems of communication—and as an inveterate user and maker of tools. He is by no means the only animal who has created a society, but no other animal has lived under so many different social forms as he.

A rapid survey of the whole reach and extent of human behavior reveals the following as among its more prominent characteristics:

(1) *The human organism is ceaselessly active.* The infant is a going concern from the very start. Even before birth some of his movements in the womb can be felt, and countless others no doubt go unnoticed. It would be difficult to exaggerate the amount of movement going on in a human being, even when he is at rest or asleep. Live muscle, for example, exhibits tonus; that is to say, it is continually receiving excitations from afferent or incoming nerves, and is aquiver at the rate of ten or twelve vibrations per second.¹¹ There is also a certain amount of nonneural tonus. In addition to these minor shakings and tremblings, gross body movements of every sort are continually taking place. Multitudinous in number and almost infinite in variety are the activities of the human organism.

To ask in general, then, why men act is simply to waste words. And to ask the question in a specific situation is usually to raise a moral problem. Man requires no motive to act—though he is often at pains not to lack one. It is a monstrous assumption, says Dewey,¹²

* See Chapter IV for a brief description of the human nervous system.

that man exists naturally in a state of rest so that he requires some external force to set him into action. . . . In every fundamental sense it is false that a man requires a motive to make him do something. . . . The whole concept of motives is in truth extra-psychological. It is an outcome of an attempt of men to influence human action, first that of others, then of a man to influence his own behavior.

With the establishment of this truth, a whole series of false and misleading theories of motivation disappear, and the stage is set for a description of how men really do act, of the concrete modes of response exhibited by them. Inquiry turns from the causes of action to the manner of its organization in the course of experience.

Life, then, is action; and throughout all of its phases action remains of primary significance. Nothing is harder for a little child than to keep still. The power of quiet contemplation is of late growth, and is never very completely established in us. When we think of a thing we *list* towards it, as though to put ourselves in an easier position to grasp it. Thinking is itself a mode of motor response.* Further, the necessary basis for mental activity, and its necessary conclusion, is to be found in activity. Thinking which does not spring from some gross motor need, and which does not lead to some gross motor consequence, is likely to be feeble and insignificant. It is not a good thing that so much of our intellectual life should be built around "the tiny muscles that wag the tongue and pen."¹³

(2) *The organism is in intimate contact with its environment.* It is *bathed* in it. Even more, it is a part of its own environment. Stimulus and response are really not two different things, but two phases of a single process. What the organism does changes the forces which are acting upon it, and these changes in turn alter the reaction of the organism. What shall be capable of evoking a response from the organism is determined not only by external forces but also by the state of the organism itself. An illustration may help to make the point clear. As I sit alone at my work, I am

* This topic will be developed at greater length in Chapter VII.

suddenly brought to a stop. Something is missing that was here a moment ago. What can it be? I make searching movements; I feel among my papers, look here and there, ransack my mind for clues. Each of these operations adds itself to the total situation and becomes, as it were, a part of the whole complex stimulus, arousing other responses which in turn alter the total aspect of things. Suddenly the problem is solved. The clock has stopped. I am strongly moved to get up and wind it, although when I sat down I never noticed whether it was running or not. I resume my writing; but this activity too is affected by what has just happened, and has become a different thing than it was before the interruption. This instance was drawn from adult experience; but the intimate relation of the organism to its environment is no less obvious in the case of the newborn child.

The various categories of academic psychology—sensation, perception, conception, emotion, habit, memory, imagination, reflection, etc.,—are but names for one phase or another of this process of intimate interaction of an organism with an environment.

(3) *The organism responds throughout (though often, indeed, not as a whole) to stimulation.* In performing even the simplest acts, the whole body comes into play. All phases of our life interact, and no function is strictly localizable in but a single part. No part of the body is merely vegetative, merely sensuous, merely intellectual. This, essentially, is what Kempf means when, in reaction against efforts to tie specific processes down to specific organs, he observes,¹⁴ "In simple terms, we feel and desire with our viscera, think with our muscles, and are conscious with our whole body."*

This is not to say that human responses are highly coördinated, either at birth or later. It has already been pointed out that the precise opposite is the case. Although the organism responds throughout, all parts do not work together in perfect harmony. A large part of all human activity is

*Of course, as even this quotation suggests, some parts of the body are nearly always more essentially involved than others. Activity usually centers around some special set of processes; or can best be controlled by the application of energies at some special point.

random, even in such highly trained acts as the golf drive or the tennis service. Our make-up is not highly specialized; we are Jacks-of-all-trades. As a consequence we seldom secure a high degree of precision in our responses. We have come to realize this somewhat, and so we rely more and more on machines and instruments for really delicate work. But whatever we do, whether it be loafing or running a race or thinking or hating or whatnot, we do it with all we are.

(4) *In the course of development, responses to a certain extent become ordered.* Some appear more frequently than others and in preference to others. This is a result, purely and simply, of the action and interaction of impulses. No one part of our nature, of course, performs this function exclusively.

There is no agency exclusively devoted to selection, no factor of selection that is nothing more than that. . . . Selectiveness is a property of any tendency or interest, and not the property of some one general agency existing alongside of the specific tendencies.¹⁵

This function of control has often been assigned to reason or to the soul. This, of course, is quite proper if these terms are regarded merely as names for the fact that some kind of organization is attained: but organization is attained, if at all, by the interaction of impulses and not by the promulgation of decrees from a central seat of authority. The tendency to reason things out is but one impulse among many in the human being; and its rôle in determining the contours of our lives both is and should be a relatively minor one.

What we call personality is nearly always a surprisingly loose and even contradictory array of frequently functioning tendencies that have to some degree come to terms with each other, and which determine the peculiarities of a person's responses and attitudes. Certain insane persons, it is true, give one the impression of being controlled throughout by one or a very small number of selective agencies. Their personalities are much more thoroughly integrated than those

of the normal individual. A high degree of personal integration, therefore, does not argue a high degree of adaptation to life conditions, although perhaps the two things do commonly go together.

(5) *Individuals differ from one another.* This is true from the very beginning; the whole story of development merely serves to emphasize this fact and drive home its many social consequences. What one person does easily another cannot do no matter how hard he tries. Whole aspects of human life are closed to many men, not because they are prohibited from participating in them by any external restraints, but because these things mean literally nothing to them. In the smallest matters as in the most important, the manner in which one man differs from another will help to determine loyalties and aversions, successes and failures, happiness and misery. In any culture, an enormous gulf separates the few best from the general level of mankind. Many of the members of every culture are almost entirely out of touch with its achievements, and are thoroughly unable to participate in their creation, their appreciation and their preservation.

REFERENCES

¹ See A. E. Shipley, *Life, A book for elementary students* (Cambridge, Cambridge University Press, 1923); E. B. Wilson, *The Cell in Development and Heredity* (3 ed., Macmillan, 1925); G. R. DeBeer, *Growth* (London, Arnold, 1924).

² For data on Mendelism and other recent developments in biology, see T. H. Morgan, *A Critique of the Theory of Evolution* (Princeton University Press, 1916); T. H. Morgan, *The Theory of the Gene* (New Haven, Yale University Press, 1926).

³ For a good summary of the situation with respect to the inheritance of acquired characters, see the essay by J. A. Detlefsen in *Our Present Knowledge of Heredity, A series of lectures given at the Mayo Foundation and the Universities of Wisconsin, Minnesota, Nebraska, Iowa and Washington* (St. Louis, 1923-1924 (Philadelphia, Saunders, 1925), 75-99. The accompanying bibliography will be found helpful.

⁴ H. S. Jennings, *Prometheus, or Biology and the Advancement of Man* (N. Y., Dutton, 1925). Consult also C. M. Child, *Physiological Foundations of Behavior* (N. Y., Holt, 1924), and C. J. Herrick, *Neurological Foundations of Animal Behavior* (N. Y., Holt, 1924), for suggestions as to contemporary tendencies in biology centering around the points discussed in the text.

⁵ Carl Kelsey, *The Physical Basis of Society* (N. Y., Appleton, 1916), 20-21. This book contains much curious and valuable information not otherwise easily available.

⁶ Graham Wallas, *Our Social Heritage* (New Haven, Yale University Press,

1921), Chapter 2. See also R. Austin Freeman, *Social Decay and Regeneration* (London, Constable and Co., 1921), 1-2.

⁷ See R. E. Park and E. W. Burgess, *Introduction to the Science of Sociology* (2 ed., University of Chicago Press, 1924), 239-243, 271-272, 276, for data and bibliography covering the interesting subject of "feral man."

⁸ J. B. Watson, *Behaviorism* (N. Y., Peoples Institute Publ. Co., 1925), 90-99.

⁹ For one of the best of the lists, see E. L. Thorndike, *The Original Nature of Man* (Vol. 1 of his *Educational Psychology*, 1913). For criticism of Thorndike's list, see J. B. Watson, *Psychology from the Standpoint of a Behaviorist* (2 ed., Phila., Lippincott, 1924), 275-282. For criticism of the concept of instinct, see Knight Dunlap, Are there any instincts? *Journ. of Abnorm. Psych.*, Vol. 14 (1919-1920), 307-311. For an amusing account of how one list of instincts was constructed, see the article by H. C. Warren, *Psych. Rev.*, Vol. 26 (1919), 199-203.

¹⁰ Jennings, 51.

¹¹ D. F. Harris, *Nerves* (N. Y., Holt, 1913), esp. 146-9.

¹² John Dewey, *Human Nature and Conduct* (N. Y., Holt, 1922), 118-119.

¹³ G. Stanley Hall, *Adolescence* (N. Y., Appleton, 1905), Vol. 1, xi-xii.

¹⁴ Quoted from a review by M. W. Peck of Kempf's *Psychopathology*, in the *Amer. Journ. of Psychiatry*, Vol. 1 (1921-2), 128.

¹⁵ R. S. Woodworth, *Dynamic Psychology* (N. Y., Columbia University Press, 1918), 125-126.

Chapter II

THE SOCIAL ENVIRONMENT

*The culture concept*¹

Anthropologists engaged in the comparative study of human societies use the term *culture* as a general name for the entire round of life activities exhibited by a group. The term is employed without the intention of conveying praise since every group possesses a culture, no matter how simple or degraded it may appear to the members of other groups. The pattern of its culture enters into and affects almost everything that is done within the group, whether by single individuals, by aggregates of individuals, or by the entire society.

The activities of even seemingly simple societies are very numerous. There is the daily routine of tasks and duties, with its seasonal and other variations; there are the movements from place to place, the goings and comings for business and for pleasure; there are the innumerable ways of expressing the feelings and emotions, and all the activities of thought, creation, and communication. All these goings on, these ways of looking at things and ways of doing them, together with the tools and devices required to make them possible, collectively constitute the culture of the group. But two kinds of activity are not included under the term:

(1) Purely physical processes, *i.e.*, such phenomena as storms, the fall of heavy bodies, etc., into the occurrence of which there enter no components of social derivation. Many physical processes, of course, are more or less directly connected with social activities, and therefore form part of the culture complex, as when the firing of siege guns causes a storm (if, indeed, a storm can be caused this way), or when a lumber company fells trees.

(2) Processes of purely individual origin. That purely idiosyncratic actions occur seems beyond question, although

they are not always easy to designate and are certainly much less numerous than we commonly believe. Efforts to retain one's balance after stumbling, the watering of the eyes when they are irritated, drowsiness and lethargy after hard work, the recurrent need for food, and other similar phenomena, however, depend only very indirectly (if at all) upon social structures for their existence and therefore do not belong to the category of culture.

The distinction between processes of purely individual origin and processes affected by social components is seldom easy to make. With respect to our metabolic requirements, for example, the general need for something to eat at intervals is an organic matter, but the need for a particular food or for three meals a day is socially derived. The meal as we know it is a culture phenomenon peculiar to our own group, and of fairly recent origin. The household ordinances of Henry the Eighth of England, for example, provide for but two meals during the day, a dinner at ten o'clock and supper at four.² Many primitive peoples eat when they can and as long as the food holds out. Among the islanders of the Torres Straits,³

There are two main meals in the day, one in the early morning and the other at sunset, but in addition they eat at all times of the day. . . . There is an old saying, . . . "Miriam and Dauar men you begin food to eat small daylight and at night (are) finishing," in other words, owing to the abundance of food, the Murray Islanders eat from sunrise to sunset or even later. A Murray Islander informed Dr. C. S. Myers, "Sun he come up, sun he go down, eat and drink all day before missionary come. Missionary he make him eat, breakfast sun there, dinner sun up there, and supper sun down there."

If the purely biological components of so simple an activity as eating are difficult to determine, the situation becomes obscure to the point of making analysis almost impossible in the case of more complex behaviors. Who could say, for example just how much of a man's religious activity goes back to the individual considered in isolation from his group?

The primary aspect of most culture traits is psychological

Although most (though perhaps not all) culture traits secure a material embodiment, the most important aspect of nearly all such traits is not to be found in these material developments, but rather in the attitudes, conceptions, and adjustments they evoke in the members of the group. The material apparatus of a culture trait will consist of such things as natural objects, tools, instruments, machines, devices, furnitures, books, and in fact all kinds of utilized, manufactured, and constructed articles, from the simplest to the most complex. There may be some culture traits without a material foundation, but every culture phenomenon beyond question involves some association or connection with human beings, and some alteration or adaptation of human nature. This relationship, or complex of relationships, in nearly all cases defines the culture trait and determines its importance. With much the same apparatus many different things can be done, depending on the way men have learned to use it.

Techniques are, therefore, more important than tools. An ax, for example, is no tool to a man who does not know how to handle it; yet axes are among the simplest of the implements our culture puts within our reach. Imagine all the machines and factories that collectively embody our industrial system destroyed by an immense cataclysm which leaves, however, all the crafts, arts, skills, knowledges, and attitudes intact in the minds and muscles of those who operated them. The western world would, of course, stagger under the blow and extensive rearrangements of its life would be necessary for a time; but it would not be long before the situation would be under control, new tools would be devised to take the place of the old, and industrialism would again be solidly established. Continuity with the past would have been maintained by the persistence of characteristic ways of thinking, acting, and feeling. Such a disaster might even result in certain gains, for we can often do a thing better when we make a second attempt. Much of the chaos and cost of the early Industrial Revolution might be avoided in the rebirth.

If the situation were reversed, however, and the machines and factories were left standing, while the techniques and attitudes necessary to their use were subtly abstracted from men's minds and muscles, the denudation would probably be so extensive as to reduce us at once to a subhuman level. Or, if the disaster proved less complete and overwhelming, the machines would no doubt strike our eyes as meaningless survivals from a curiously irrelevant past, and we should regard them, somewhat as we do the Pyramids or Stonehenge, with mingled interest and wonder that men should ever have thought it worth while to produce such eminently useless things.⁴

While the most important aspects of a culture are psychological, the material embodiments of culture traits are by no means insignificant for an understanding of social processes. In a living culture tools generate and extend techniques. In addition, the inert mass of material culture often offers stubborn resistance to change long after the time has arrived when men look forward with eagerness to a new order of things.

A large part of culture works below the level of consciousness

Although the focus and nub of a culture is to be found in human beings rather than in natural objects, no person can hope to have precise conscious knowledge of more than a small part of the whole sum of cultural forces at work in his life. Every culture is composed largely of unnamed and unnameable elements which are completely taken for granted because they function below the threshold of recognition. Only occasionally do we catch fleeting glimpses of these subliminal cultural forces. Even in simple situations, when we follow what seem to us the only sensible—indeed the only possible—lines of action, we are as often as not merely acting within the confines of our culture pattern.

This fact, no doubt, in large measure accounts for the difficulty of making translations from a foreign tongue. Authors depend on the "haloes" of words—on the fringe of unexpressed though suggested images and attitudes associated with them, and these differ widely from language to

language. When we read a poem written by a member of our own group, the words (especially if we are in the habit of reading poetry) carry us beyond their immediate dictionary meanings, and create an atmosphere which is one of the chief bases of our pleasure. This atmosphere is almost entirely lacking when we read (say) a Navaho song, and the whole production can easily seem queer, childish, bizarre, obscure. Consider the following rain songs:⁵

- (1) The corn comes up; the rain descends

Nayayaie anthane

I sweep it off. I sweep it off.

Anthane.

The rain descends; the corn comes up

Nayayaie anthane

I sweep it off. I sweep it off.

Anthane.

- (2) In Tse 'gihi,

In the house made of dawn,

In the house made of the evening twilight,

In the house made of the dark cloud,

In the house made of the he-rain,

In the house made of the dark mist,

In the house made of the she-rain,

In the house made of pollen,

In the house made of grasshoppers,

Where the dark mist curtains the doorway,

The path to which is on the rainbow,

Where the zig-zag lightning stands high on top,

Where the he-rain stands high on top,

O male divinity!

With your moccasins of dark cloud, come to us. . . .

Poems like these can hardly be appreciated without a fairly intimate acquaintance with Navaho culture. Those who have studied this culture closely probably feel some of the poetic values embodied in these semi-ritualistic songs. They are really untranslatable, except by means of bulky commentaries which set out in order the esoteric connotations of the terms that are employed.

Every group applies certain principles of order and appropriateness to its literary productions. Chesterton in the first of the following passages indicates some of the things that English poets cannot easily do; while in the second another author states how a certain Indian tribe approaches its poetry:⁶

- (1) A poet indifferent to form ought to mean a poet who did not care what form he used as long as he expressed his thoughts. He might be a rather entertaining sort; telling a smoking-room story in blank verse or writing a hunting-song in the Spenserian stanza; giving a realistic analysis of infanticide in a series of triolets; or proving the truth of Immortality in a long string of limericks.
- (2) In Sia songs there must be six parts, for north, south, east, west, zenith, and nadir. If a song had not six lines in a certain order, six stanzas in the same order, the Sia listening would be completely perplexed and troubled. To him the song would be unfinished; out of it he would get no æsthetic experience at all.

Human needs and cultural offerings

Every culture complex contains many elements arranged in an intricate and varied pattern. This pattern of relations always corresponds quite closely to the basic human needs discussed in the preceding chapter, as can be seen from the following classifications of (a) human needs, (b) cultural offerings.

(a) A human being needs:

- (1) To be born, to be protected against brute annihilation, and to be assured the satisfaction of the basic metabolic and life-sustaining processes. Among these are such things as breathing, eating, drinking, excretion of waste products, human companionship, sexual activity, protection from the elements, activity and rest, sleep, etc.
- (2) To be brought to maturity, and to become acquainted with the ways of nature and of his group, so that he can take care of himself.

- (3) Opportunity for the exercise, development, control, and refinement of his particular powers and interests as they make their appearance. Unless this is guaranteed he is bound to be dissatisfied with his lot.
- (b) A culture offers:
 - (1) Association, or the fact of living together—a fundamental mode of life and arrangements which make the group a unit. This it is that makes the members feel that they “belong,” and it is the single most important fact about a culture. The basis of social union differs from one culture to another.⁷
 - (2) Schemes for providing and distributing the things held to be basic to life and well-being. These schemes determine not only what natural resources are used for these purposes, and how they are used, but also the various occupation groups with their specialized functions, monopolies, privileges, etc.
 - (3) Ways of understanding and controlling the phenomena of nature and of life, and arrangements (formal and informal) for imparting these data to new members of the group.
 - (4) A large number of special associations, groups, clubs, circles, etc., both to perform the above functions and to minister to the various more special interests of members of the group.

Even a hasty comparison of these classifications is enough to suggest a correspondence between human needs and cultural offerings. As a matter of fact, the connections are so intimate and complex that they cannot be represented adequately in a summary tabulation. A single human need may be served in several ways, and a single cultural element may minister diversely to a variety of needs. Where, for example, is religion to be placed among the human needs? In the same or in different persons it can fulfill any or all of the functions we have distinguished. (1) To some, religion is as necessary as life itself. To many a mystic the candle of life burns only within the aura of the religious experience. (2) No group is without a religion, and so even the man who is not normally endowed in this respect often finds it neces-

sary to react to the religious convictions and behavior of other members of his group. (3) The need of opportunities for the exercise and development (or, in some cases, for the curbing) of the religious impulses which manifest themselves in most men is quite evident.

In a similar manner, religion is capable of fulfilling any of the cultural functions enumerated in the classification. (1) It has at times served as the basic principle of association. This was the case among the Mohammedans at the height of their power, and perhaps also in medieval Christendom. (2) Religious beliefs often affect the economic life of the group, as in the case of the Christian Sabbath, which once required a fairly complete cessation of economic activity. Not only are religious observances and piety thought to be profitable; religious scruples and tenets actually affect the conditions under which life needs are satisfied. (3) Most religions, and Christianity perhaps above all others, offer rather complete schemes for understanding the world, as well as codes for the regulation of the believer's conduct. Whether these religious philosophies and codes of action are valid or not, they do have social consequences. (4) Finally, religion ministers in many ways to the special interests of human beings by providing careers, offices, organizations, loyalties, and the like in great profusion.

What has been said concerning religion might be repeated with reference to all other aspects of social life. Every element in a culture pattern satisfies a wide variety of human needs; or, to put the thing in social terms, fulfills a wide variety of social functions.

Human needs and the culture pattern are never perfectly adapted to each other, however, and in nearly all cultures important human needs are very imperfectly satisfied. In many instances, no doubt, the existing cultural developments are positively detrimental to human well-being. The chief reasons for such maladaptations are ignorance, the interference of special interests, and changes in the conditions of life unaccompanied by correlative social changes. Wherever maladaptations occur, the interdependence of the individual and the group is by no means destroyed, for this

interdependence is a permanent feature of the social situation. Instead, the stresses and strains set up generate aberrations of one kind or another in the individuals composing the group, and they exhibit the symptoms of what might be called a social disease.

These remarks apply to our own culture no less than to others. Consider, for example, the status of art in a highly industrialized society. To nearly all of us, certain shapes and forms are more pleasing than others; that is to say, we are to some extent appreciative of beauty. In addition, many of us possess to some small degree the power of making beautiful things. In some persons, however, the feeling for beauty is exquisitely developed; and in a few the power of artistic creation has blossomed forth into a lovely flower. What even such persons will be able to appreciate and will call beautiful is, of course, surprisingly dependent on social standards, and will differ greatly from one society to another. But some part of it will go back to personal endowment pure and simple. Such persons, however, will usually need the stimulus of a friendly social environment to help them develop and give form to their powers; for few of us are strong enough to stand alone. Now, if people like this live in a highly industrialized society, where nearly all of the goods of life are made by machines, often with little regard to artistic canons, and where quantity of production is frequently considered more important than quality, many of them are bound to feel frustrated, and their artistic impulses will not remain unaffected. They may not cease to produce works of art, but may band together in little coteries and patronize the trivial, the exotic, the unhealthy, or the merely shocking. Such vagaries are the natural outgrowth of an uncongenial social environment. In a similar fashion, the lives of those who might have been appreciative of artistic creations, although they have little creative power themselves, will also be affected.

It does not follow from what has been said that art cannot flourish in a great industrial civilization. The existing difficulties may be temporary; old arts may be vigorously reborn in our culture, or big industry may give birth to new

arts of its own—to such things as skyscraper architecture, great ocean liners, vigorously modeled automobiles, new literary styles, etc.—thoroughly worthy of comparison with the arts of the past. But, on the other hand, if modern industry remains indifferent to art, we may see the esthetic impulse starved and pushed into the nooks and crannies of life. The thing might go so far as to result in a whole society almost completely devoid of developed artistic interests, and almost entirely lacking in creative artistic talent. One of the great historic life-giving foods of the mind of man would then be missing, and we should be living starved and hampered lives.

As we shall try to show in Chapter XIV, there is nothing intrinsically detrimental to human interests in the existence of machinery in a culture. It all depends on our attitudes towards the things we have. We certainly do possess more apparatus than any other culture; and there seems to be no unsurmountable reason why most of the things we have should not be made esthetically satisfying. As a matter of fact, some would hold that the average man is surrounded by more opportunities for esthetic development at the present time than he ever was in the past; although they would admit that there have been greater creative periods than the present.

Early cultural achievements

Some of the earliest cultural achievements transmitted to us from the most distant times are so deeply inbedded in our life that we do not commonly regard them as social constructions at all. Their existence is mute testimony to the tremendous influence the culture pattern exerts upon us. The origins of most of the great constructs upon which our civilization rests are lost in the dim and remote past. We are indebted to we know not whom, in we know not what distant age, for such things as the development of language; the subjugation of fire; the invention of writing and the alphabet; the discovery of the principle of the lever; the introduction of pottery and weaving; the domestication of animals and of plants; the development of government and

of settled ways of life; the elaboration of processes for the extraction of metals from their ores; the creation of the rich pictures furnished by mythology; and many other developments of equal magnitude. Similarly anonymous are the originators of the great categories in terms of which we still conduct our thinking; of such things as the notion of cause and the principles of inference; the fundamental interpretation of life associated with religion; the great idea of responsibility; the distinction between a thing and its qualities; the analysis of experience into various degrees of validity (as the real, the remembered, the dreamed of, the imagined, etc.); and a thousand other nodes of our mental life.⁸

Many things have come down to us from the past, and many others of perhaps equal worth have been lost in time's ceaseless shiftings. The history of a culture is not a tale of constantly accelerating progress, of the steady accumulation of all the riches of all the ages for our delectation and advantage. Every contemporary culture, our own included, stands at the end of a long historical process in which much has been lost and much gained, much remembered and much forgotten—in which, in short, there has been a continuous interchange of culture materials in all directions rather than a steady development in but one direction. A culture should not be judged by its date, nor by its congeniality and attractiveness to the person who happens to be judging.

Institutions

An inspection of social life reveals two fairly distinct types of phenomena:

(1) *Social relations*—actual social interactions carried on within the terms of the culture under examination. Most of these activities are customs—conventionalized acts exhibited by all (or nearly all) the members of a group. Thus in our culture it is customary for a gentleman to tip his hat when he meets a lady of his acquaintance; for a woman to take the name of her husband when she marries; for the conductor of an orchestra to use a baton; for clergymen to wear a distinctive kind of dress; for horses to be shod; for flags to be displayed on national holidays; for bank presidents to

play golf; for professors to maintain an air of aloof impartiality in the face of all the things that normally concern human beings. Customs are often called social habits; and the phrase is permissible as a useful figure of speech.

(2) *Institutions*—"the determinate forms in accordance with which men enter into social relations."⁹ Institutions, that is to say, indicate how men under given conditions shall perform social acts, although they are not themselves specific ways of acting. Institutions in this respect resemble an architect's plans. The plans are not a building; but they do indicate how a building shall be erected. Thus a code of honor is not a concrete set of actions; but it does tell people how to act in concrete situations. So with the family; *it* does nothing, but the members of a family are placed in certain situations and have many obligations and privileges because they belong to that institution.

Institutions *structuralize* a culture. They canalize and organize its activities; or, once more to change the figure, they provide the pigeonholes or categories in terms of which men define what they shall be and do. They furnish the framework or scaffolding for the group constructions. Every culture is rich in institutions of varying degrees of complexity, and serving a large variety of human interests. Nor is every institution a distinct and separate entity, guiding and directing human activity in complete independence of other social forms. The more complex structures always include minor, partially independent, substructures, and the boundaries of different institutions cross each other in perplexing confusion. Thus the institution of marriage is partly bound up, not only with the family, but also with the law (since marriage is a form of contract); with dress (since a garb appropriate to the occasion is usually prescribed); with business (since there are rings and veils and flowers and many other things to buy in connection with the ceremony, and since marriage usually marks the formation of a new economic unit); with religion (since marriage is often regarded as a sacrament); with politics (as in the case of members of a royal house); and, indeed, with a myriad other social forms. The connection and relations of an important

institution stretch out to the farthest limits of the social structure, and affect, and are affected by, countless other social arrangements.

Even when institutions are very closely related they are frequently only partly synthesized. That is, while the existing arrangements compel a number of institutions to function together, they may be so constituted that they cannot function harmoniously. This is sometimes the case with laws. Since they are laws, we feel that they should be respected and enforced; but we are confronted with aggravating dilemmas when they run counter to long established ways of life. Confusions and conflicts of purpose and action naturally result—witness our troubles with the Eighteenth Amendment.

The heart and core of a living institution is to be found in the shared human purposes and ideals which lie behind it. Institutions are moribund and in process of decay, though they may for a time persist to encumber the social scene, when they are no longer warmed by human allegiance and loyalty. This allegiance need not be actively and explicitly recognized by all the members of a group for it to be effective. But when men begin to exhibit disaffection and apathy towards an institutional structure, the importance of faith and confidence in it becomes apparent. It is possible that societies decline and disappear more through failures in morale than for any other reason. A conquered people need not lose its identity and become a mere memory of itself, if it can only maintain a lively faith in its own folkways in the face of the invader.

The number and variety of institutions in our culture

A complete enumeration of the institutions of a culture in their many interrelations would give an outline picture of its social structure. The classification of cultural offerings presented earlier in this chapter was really an attempt to carry the analysis a step further, since its aim was to indicate in the briefest possible compass the kinds of institutions to be found in any society. The very generality of this classification, however, requires that it be supplemented by material,

of greater concreteness. In the present state of our knowledge no complete analytical catalogue of the institutions of any specific culture is possible; but a summary list of a few contemporary institutions may help to clarify the meaning of the term. The headings of the following classification have been rather arbitrarily chosen, and are not to be taken as exhaustive:

Domestic—the family; marriage; relationship; the home; the meal; telling children stories; inheritance; having books in the home; etc.

Economic—the various occupation groups; barter and trade; credit; money; the rights of property; industrialism; the factory; division of labor; distinction between employer and employee; laws regulating trade and commerce; etc.

Political—the state; the party system; universal suffrage; the police power; the principle of checks and balances; letting the country be run by politicians; the various governmental offices; representation in Congress determined geographically (by congressional districts, etc.); "law and order;" war; etc.

"Social"—friendship; romantic love; rules of social intercourse; etiquette; play (and all the various games); charity; arrangements for health, insurance, and the like; etc.

"Personal"—classifications as to age, sex, status, locality, etc.; the idea of being a distinct personality, and of "amounting to something;" ways of regarding one's self; etc.

Educational—the school; books; libraries; the newspaper; moving pictures; the various ways in which gossip and rumor are institutionalized; etc.

Moral—leagues for and against vice; moral and ethical codes; the rights of animals and of children; the notion of what constitutes "a good time;" etc.

Religious—the church and churches; the clergy; "the Christian way of life;" holy days and sacraments; Heaven and Hell; the Bible; monotheism; etc.

Artistic—all the various arts and crafts; the canons and principles of art, and of the various arts; the symphony, the sonnet, and all other art forms; etc.

Scientific—All the various sciences, and the habits of thought they characteristically generate; the experimental method; hypotheses; the laboratory, the test-tube, and the

microscope; the notion of cause; the idea of one uniform nature; etc.

How cultures change

Even a list so incomplete and sketchy as the above cannot fail to suggest the great medley of impulses behind social activity. A single institution may serve a staggering array of human needs, and by its permeation into other institutions and into the deepest recesses of our lives may seem almost beyond essential change. Consider the present economic order—its effects invade the farthest reaches of human living and thinking. Scarcely a single human impulse of any consequence could be named whose expression has not been altered in important ways since the rise of industrialism during the last two or three hundred years. Yet nothing is clearer than that such institutions do change, and even disappear, for the past is richly strewn with their wrecks. How, then, do cultures change? Two processes may be distinguished:

(1) *Diffusion*—the importation of elements into a group through the contact of cultures. Cultures are never perfectly isolated, and a constant interchange of culture elements goes on even between primitive cultures. The process involves the exchange, not merely of material goods, but also of ideas. Culture elements originate in one area and are carried to contiguous regions, being altered, if necessary, to adapt them to the culture patterns into which they are assimilated. In the case even of primitive groups with no written records, it is often possible to draw maps indicating where particular traits must first have arisen.¹⁰ It is difficult to realize to what an extent borrowing is characteristic of culture history; the attempt to locate the origin of the elements of any culture would probably take us over continents, across seas, and in some instances, perhaps, to all parts of the globe.

Our own culture offers many examples of materials obtained by processes of diffusion. Even if we disregard such minor borrowings as the derivation of tobacco from the American Indians, coffee from the Arabians, silk from the

Chinese, the vine from the Caucasus, astronomy from Chaldea, etc., there yet remains a considerable number of cultural loans of the very first magnitude. Modern science, modern art, and modern philosophy were fed at their sources by materials drawn from Greek culture; the Christian religion originated in Palestine; the Phœnicians gave us the alphabet and the Hindus (through the Arabs) our number system; the Romans and the Teutons our system of law; nor did any one of the cultures that made these major contributions to our life elaborate them in isolation from other culture contacts.

And, on the other hand, in recent centuries our culture has spread over the whole globe, effacing or degenerating practically all of the minor cultures that once dotted the earth's surface, and even seriously threatening the great civilizations of Islam, India, and China. This is indeed "the European epoch of the human mind." It can seriously be doubted whether the wholesale destruction of cultures that has accompanied the spread of western civilization is a good thing. In many instances whole peoples have been completely destroyed, along with their arts, achievements, and general outlook on life. The invader is as a rule both unwilling and unable to salvage these things. Quite aside from questions of justice, this makes the world so much the poorer in the resources of the mind. Every people has its own religion, its own mythology and folklore, its own store of homely wisdom, its own arts and knowledges, its own organization of life. It takes long ages of living together to form a culture, and it seems as if time itself were being attacked when cultures are destroyed.

(2) *Invention*—the putting of already available materials to new uses. This topic will be discussed in another setting in a later chapter, so it will suffice for the present to remark that inventions do occur in every group; indeed they are found to be exceedingly common when once the term is properly understood as not implying more than a minimum of originality. Adaptations and adjustments of the existing cultural materials are continually occurring, and in this give and take culture traits slowly acquire new forms. Thus languages undergo long-term changes which are only notice-

able after they have accumulated in the course of centuries.¹¹ No Chaucer, Shakespeare or other great molders of the speech is here required; slowly and imperceptibly through countless minute inventive adaptations, the pronunciation and usage of words is altered.

The process of diffusion may in one way be regarded as a special case of invention, for borrowing from other cultures always involves some degree of inventive adaptation. With invention proper, however, no new elements are introduced into the culture from another complex, since the whole process is confined to a working over of already available materials.

Our dependence upon our culture

A man would have to work for many lifetimes to make all of the things he uses in the course of a single day, if indeed he could ever hope to learn all of the arts and techniques necessary for such a task. Primitive peoples sometimes ask white men whether they themselves have made their own clothing, shoes, gun, camp equipment, etc., and are surprised to learn that nearly all of these things were made for them by other persons. But the primitive himself is really no better off; he may have been his own artisan, but he cannot have been the inventor of all the arts he practices. He too is dependent upon his culture for the apparatus that makes his life possible.

But a man's dependence upon his culture pattern extends much further than this. Both the questions he asks the world and himself and the answers he finally gives to these questions, are culturally determined except in the case of persons of the greatest originality. Lévy-Bruhl elaborates this point in his book entitled *Primitive Mentality*. He shows, for example, how living in an orderly, well-established society affects our notion of causation:¹²

The uninterrupted feeling of intellectual security is so thoroughly established in our minds that we do not see how it can be disturbed, for even supposing we were suddenly brought face to face with an altogether mysterious phenomenon, the

causes of which might entirely escape us at first, we should be convinced that our ignorance was merely temporary; we should know that such causes did exist, and that sooner or later they would declare themselves. Thus the world in which we live is, as it were, intellectualized beforehand. . . . Our daily activities, even in their minutest details, imply calm and complete confidence in the immutability of natural laws.

Nor are the emotions, those presumably most personal and internal of all our experiences, free from the influence of the group. When shall we feel grieved, insulted, elated, disturbed, insensate, and how shall we give vent to these feelings? Our culture has developed formulæ which tell us when and how to be moved, and without being distinctly aware of the fact we usually follow its rules. It is not that we should be entirely without feelings except for cultural indoctrination—an infant can exhibit a perfectly respectable rage in absolute independence of any training—but that the feelings we do have, with their accompanying behaviors, are in large measure socially determined.

The virtues we praise and the vices we abhor are similarly described and classified for us by our culture. Oftentimes one group will admire the very thing that another group will despise. We assimilate these preferences and aversions, and seldom work our way around them. Aristotle, for example, is the author of the greatest treatise on ethics ever produced in the western world, and yet, following a very characteristic Greek ideal, he elaborates the following picture of one type of virtuous man: * ¹³

This man rightly regards himself as worthy of high honors, and he possesses the greatness appropriate to every virtue. He will be only moderately pleased when honors are bestowed upon him, for they are really less than he deserves; but he will accept them for lack of something better. He is little interested in wealth, political power, or success, and must often appear disdainful. But his contempt is justified, for he estimates other people at their real worth. He will face great dan-

* I have taken the liberty of condensing Aristotle's description somewhat, without, however, altering its general content.

gers gladly, for this brings in honor, but small dangers do not interest him. He will confer benefits, but is ashamed to receive them, for that would make him feel inferior. And so he remembers those whom he has helped, but forgets those who have helped him; and he likes to be reminded of his benefactions, while he cannot bear to be told of those who have benefited him. He is open in word and deed, and does not hesitate to say whatever he thinks. He admires but few things. He will speak evil of his enemies only in order to insult them. He will not easily cry out for help, nor be always bustling around.

This certainly does not seem to us a very attractive sort of fellow, and we may even be inclined to believe that the passage is satirical. But the fact would remain that Aristotle here describes a highly esteemed Greek ideal—witness Achilles and many other Homeric heroes. In the same manner our culture holds before us certain standard types, and after them we model our lives.

Our sensitiveness to group pressures does not leave us when we are quite alone, for it is reflected in our most private natures. We may have been pretending to be something that we are not, and may shed our hypocrisies like a cloak when once we have left the crowd; but we do not thereby divest ourselves of the patterns of our culture. The very notions that we frame of ourselves in large measure were shaped for us by the activities of our group. That inner citadel of personality about which we center our thoughts and actions is itself a culture product. At one time men realize their innermost natures by renouncing the world, at another by mastering it; at one time by shutting their hearts to all the voices of love, at another by opening them to every gust of that windy passion; at one time by turning the other cheek, at another by exacting an eye for an eye.

The most original man in this respect can hardly be distinguished from the dullest conformer. Even the genius can break but few of the slender threads that bind him to the past. Few men have ever stepped even a pace or two beyond the boundaries of their own culture; and of these the greater number quickly come to rest within the confines of another already existing pattern. This is possible because,

as we have seen, cultures are not absolutely distinct units. They overlap, so that an individual may be offered advantages in a number of cultures which are in contact with one another. Quite a few persons, for example, are more or less dissatisfied with modern industrial civilization, and some have tried to disown it. Such persons almost invariably associate themselves in spirit with some other existing or historic culture. They find peace and contentment in an idealization of ancient Greece, or they learn to sing the praises of primitive life, and advocate a return to its simplicities. Such cultural expatriates almost inevitably carry into their ideal realm a poignancy of regard which the culture they idealize probably did not usually evoke from its own members; and in this and in many other ways they betray their basic affiliations. On this point a study of the world's Utopias is instructive. From Plato's down to those of H. G. Wells, they one and all clearly reveal the time and place of their origins. They were in every instance provoked by existing conditions, and their suggestions for change, however original and daring, were likewise drawn from the stock of conceptions available to the enlightened members of their *milieu*.¹⁴

No man ever invented an absolutely independent culture. In this respect cultures are like languages; they must *grow* in order to be of significance. Every great period in human history has been richly fertilized by the past. Without the help of many men who have gone before, even the greatest genius can do but little.

REFERENCES

¹ See Clark Wissler, *Man and Culture* (N. Y., Crowell, 1923) for a detailed but somewhat schematic elucidation of the anthropological meaning of "culture."

² Garrick Mallery, Manners and meals, *Amer. Anthropol.*, Vol. I (1888), 196.

³ *Reports of the Cambridge Anthropological Expedition to Torres Straits*, Vol. 4 (Cambridge Univ. Press, 1912), I.

⁴ Thorstein Veblen has more than once in his numerous writings emphasized the importance of "habits of thought" in maintaining the social order.

⁵ E. L. Walton and T. T. Waterman, American Indian poetry, *Amer. Anthropol.*, Vol. 27 (1925), 35, 50.

⁶ G. K. Chesterton, *The Victorian Age in Literature* (Home Univ. Library), 170; Walton and Waterman, 43.

⁷ R. M. MacIver, *Community* (3 ed., London, Macmillan, 1924), has written very forcefully upon the importance of association.

⁸ In this connection, see William James, *Pragmatism* (N. Y., Longmans, Green, 1907), Lecture 5, Pragmatism and common sense. The reader who remains skeptical that these things may be human constructs is also invited to read L. Lévy-Bruhl, *Primitive Mentality*, trans. by L. A. Clare (N. Y., Macmillan, 1923).

⁹ MacIver, 7.

¹⁰ See Clark Wissler, *The American Indian* (2 ed., N. Y., Oxford Univ. Press, 1922), for numerous maps showing the probable distribution of culture traits in the New World prior to the coming of the white man.

¹¹ Cf. Otto Jespersen, *Language, Its Nature, Development, and Origin* (London, Allen and Unwin, 1922), esp. Chaps. 14 and 15.

¹² Lévy-Bruhl, 35.

¹³ Aristotle, *Ethics*, Book 4, Chapter 3. Translators often turn Aristotle's name for this man into the English, "high minded man"!

¹⁴ See Lewis Mumford, *The Story of Utopias* (N. Y., Boni and Liveright, 1922), and the imaginary kingdoms referred to therein.

Chapter III

WESTERN CIVILIZATION

Civilization—meaning of the term

In this chapter we shall attempt to describe our own culture; and then in Part II we shall investigate the processes of individual development which finally lead to our admission into full membership in that culture.

Nothing is clearer, perhaps, than that we are civilized. Much as we dwell on this fact, however, few persons think of anything specific when they utter the word "civilization." It is often vaguely used in any one of a considerable number of rather complimentary senses. An effort must be made to clear the term of some of its confusions if it is to justify its place in the body of sober speech. The chief difficulty, perhaps, is that civilization has been regarded primarily with reference to its real or supposed superiorities over other forms of culture. It should be possible, instead, to list the traits which are shared by the cultures commonly called civilized; and when this is done we discover at least the four following items, which may accordingly be taken as characteristic of a civilization:¹

(1) *Urban life*. This seems to follow from the etymology of the word itself, for "civilization" suggests the mode of life associated with a *civitas* or city. For once etymology sets us on the right track. In a civilization the population is larger and the density of population is greater than in noncivilized cultures, and the people are clotted or aggregated together into fairly large groups which maintain a distinct life of their own. The members of a civilization are for the most part sedentary—they no longer roam from place to place, but have settled down, and in addition there has developed at least the beginnings of that contrast between town and country which still remains to perplex us at the present day.

Town life becomes the center of many activities peculiar to itself, and it also heightens the characteristic activities of the countryside. This is neatly recognized in English law, where a *hamlet* denotes a collection of houses too small to have a parish church; a *village* has a church, but no market; a *town* has both a market and a church; while a *city* is an incorporated borough town and the site of a bishop's see.

(2) *Complex economic structure.* The existence of towns involves rather intricate economic arrangements, including extensive developments in the way of the division of labor, barter or trade, and media of exchange. The central principle here depends on the fact that human energy can usually be more effectively employed by subdividing a task among a number of individuals than by letting each person do everything, the total product often being increased fifty, a hundred, or even a thousandfold by this simple expedient.² The specialization of tasks is found among all peoples, both through the assignment of different economic functions to the two sexes, and because of the existence of occupations requiring more or less long periods of training and experience for their satisfactory performance. But in an urban culture the necessity for a complex division of labor becomes acute; and a considerable specialization of tasks is an inevitable corollary of an extensive use of machinery. The townspeople no longer live directly on the soil, and they become dependent on the work of others for the necessities of life. At the same time they are forced to give something in exchange for the food products they consume, and this leads on the one hand to an intense development of the occupations suited to urban life and on the other to the elaboration of devices to make possible the easy exchange of goods. In this manner the main outlines of the economic structure exhibited in complex societies are laid down.

Much barter and trade goes on outside of civilization, of course, but one of the prime requisites of civilization is an intricate network of economic relationships, dependent in the end upon the intricate division of labor and the continuous existence of channels of communication and exchange within the society. And, since people cannot meet to ex-

change goods without also exchanging ideas, from trade there results intercommunication. Commerce has beyond question at all times been one of the chief agencies of diffusion, since the trader carries his culture pattern along with his pack into foreign regions.

The division of labor and intercommunication have had much to do with the development of human personality. When occupations are divided, men are encouraged to undertake more highly specialized tasks, and in widening their mastery over nature they deepen their control over themselves. In the earlier stages of the process, at any rate, the division of labor leads men into distinct yet fairly complete environments which by intercommunication they are able in some measure to share with their fellows. The carpenter is brought into intimate contact with one phase of the natural world, and is enabled to realize with some fullness the relationship between (say) wood and the general life of man. He manipulates his raw materials directly, through tools which he holds in his hands, and he is continually under the necessity of putting forth skill and ingenuity to keep his materials under control. In addition, there grows up under his eyes a finished product which represents a conquest over natural obstacles and a realization of natural possibilities for which the workman rightly feels himself almost entirely responsible. Though he may be unable to state in formal literary terms just what function he performs in the social order, he does represent something basic and fundamental, and he is himself rounded out accordingly. So too with the baker, the doctor, the lawyer, the candlestick maker, and all other workmen—provided the division of functions does not proceed too far. Men *become* something by becoming proficient in doing something. So true is this that a complex society seems necessary to the development of a complex personality. "It is only in a highly organized society, where there is much specialization of industry and refinement of the arts of life, that individuals of rich and well organized personalities may be found." ³

But the division of labor can be carried so far in certain directions that it warps and contracts the individuals who

are submitted to it. Tasks may be so minutely subdivided that no workman ever really makes anything; when this has happened a man's working hours are given over to the monotonous repetition of meaningless operations. This is exactly the situation in much of modern industry, which has become amazingly productive by extracting all semblance of meaning from the everyday work of millions of human beings. Necessary stimuli to a well rounded life are then lacking, and the great mass of factory workers are retarded in their personal development in somewhat the same manner as are the isolated dwellers in mountain fastnesses. Both groups alike are out of contact with a rich culture stream, and suffer thereby from social malnutrition.*

(3) *Development of writing.* Every civilization has developed a means of recording ideas and events beyond the stage of the pictograph, or direct realistic picture of the thing to be communicated, and has elaborated a complex graphic symbolism. In this process the symbols used in writing finally become more closely connected with certain sounds than with things, as is eminently the case, for example, with our alphabet. The various letters of the alphabet do not stand for things, but for sounds (or rather groups of sounds), and it is by combining these letters in various ways that we name things. Such a system is much more flexible than one where every distinct thing has a separate symbol, since we are able to name anything by some combination of our twenty-six symbols, whereas when pictographs are employed an entirely new symbol is required for everything that is named.

The advantages conferred by a flexible system of writing are obvious, and range all the way from the provision of an effective means of recording events and arrangements to the

* Adam Smith a century and a half ago called attention to one phase of this process, in the following passage: "In the progress of society, philosophy or speculation becomes, like every other employment, the principal or sole trade and occupation of a particular class of citizens. Like every other employment too, it is subdivided into a great number of different branches, each of which affords occupation to a particular tribe or class of philosophers; and this subdivision of employment in philosophy, as well as in every other business, improves dexterity, and saves time." ⁴ Or, in other words: under the impact of the division of labor, most men give up thinking; but this saves time!

securing of greater control and direction over thought, which tends to be elusive and vague until it can be expressed and thus held objectively, as it were, before the mind. The activities of a culture with a highly developed system of writing, however, will be reflected in that medium, and it may finally happen that many initially derivative processes will begin to take on the aspect of self-existing phenomena. This is the case, for example, with contracts. Parties who approach the making of a written contract with the simple intention of binding themselves to the performance or nonperformance of an act are often surprised to discover that precedents and procedures stand in the way of the direct and easy realization of their purpose. They must accommodate their intention to the formal and occasionally arbitrary requirements of the law of contracts.

(4) *Existence of the state.* Every society elaborates certain rules or laws pertaining to social relations, and enforces them, but in a civilization the chief enforcing authority is centralized at some point or other, and the group presents a solid compact front to other groups. The society is welded into an effective working unity under the control of a central power, which determines the general policy of the group towards its own members and towards other groups. Men become subject to the laws of this corporation by residing in the territory over which it has jurisdiction, and they are admitted to its membership under conditions which it lays down. The state has played so large a part in western history, especially in modern times, and its rôle has been so greatly magnified by historians, that we are always in danger of confusing it with society itself. The two are by no means identical, as many thinkers have been at pains to show. Consider, for example, the following rather quaint passage from Tom Paine:⁵

Society is produced by our wants, and government by our wickedness. . . . Society in every state is a blessing, but government, even in its best state, is but a necessary evil; in its worst state, an intolerable one. . . . Government, like dress, is the badge of lost innocence; the palaces of kings are built upon the bowers of Paradise.

The modern state is but one institution among the many collectively composing the social order. Many societies have had no institution at all comparable to the state; and even in modern society, in spite of the political theorists, it has not been the final source of all authority. Never, not even under autocratic governments, have all the reins of power been held by the state; indeed, as we have already seen, most of the pressures laid upon us by our group work directly, and are little if at all susceptible to conscious control. There are also many indications that the sovereignty of the state as a policy-enunciator for the group is now on the decline—witness internationalism on the one hand, and the growing importance of economic groups within the body politic on the other.

At the risk of oversimplifying the foregoing discussion, the following definition of civilization is presented: Civilization is a form of culture characterized by a sedentary population grouped around the state as the central institution, and having a symbolic form of writing and an economic structure which makes fairly extensive use of the division of labor.

As we shall use the term, it is not intended to convey praise, but merely to describe a certain culture form which has existed at numerous times in the past, and which happens still to exist in certain parts of the globe. It must not be thought that all persons who have experienced civilization join in its praise, for not a few sensitive individuals seem to dislike it heartily. Edward Carpenter, for example, has written a powerful and interesting essay entitled *Civilization: Its Cause and Cure*, in which he calls it "this thousand-year long lapse of human evolution," while Stanton Coit is responsible for a little volume entitled *Is Civilization a Disease?* Carpenter, with his eye mainly on our own civilization, writes as follows: ⁶

We find ourselves to-day in the midst of a somewhat peculiar state of society, which we call Civilization, but which even to the most optimistic among us does not seem altogether desirable. Some of us, indeed, are inclined to think that it is a kind of disease which the various races of man have to pass

through—as children pass through measles or whooping cough; but if it is a disease, there is this serious consideration to be made, that while History tells us of many nations that have been attacked by it, of many that have succumbed to it, and of some that are still in the throes of it, we know of no single case in which a nation has fairly recovered from and passed through it to a more moral and healthy condition.

It is not necessary to agree with this opinion, but it does seem highly advisable to use the word *civilization* descriptively, and not as an indiscriminate term of praise.

Western civilization

Our own culture may be called *western civilization*, and it may be historically described as the type of life which has resulted from the fusion of the Greco-Roman, barbarian (mainly Teutonic), and western-oriental cultures which began to develop in western Europe at about the opening of the modern era. The broad outlines of western civilization in its contemporary form, however, can hardly be said to have been laid down until at least the late seventeenth century, after over fifteen centuries of slow accommodation and development, and some of its most prominent features have made their appearance only in the course of the last hundred years. It has probably as yet by no means reached its zenith, and its main contours still seem subject to change.

It would be a fascinating undertaking, did limitations of space permit, to tell the story of the long process which gave birth to our contemporary culture. Men have followed many a winding path, through pleasant pasture, over hill and through briar, down into the valley of the shadow and out again, trudging now in circles, now forward, and now back again, in their great trek across the centuries, and to trace out their footprints and mark their resting places, their scenes of victory and of defeat, would indeed be a high enterprise.⁷ Instead it has seemed best to list and discuss very briefly a few of the great institutions characteristic of our culture. Every culture tends to focus at a relatively small number of points a great part of its energies, and it is

perhaps by understanding of these cultural foci that we can best come to grips with a way of life.

Western civilization in its contemporary forms, then, is characterized by the following institutions:

- (1) Natural science.
- (2) Mechanical invention.
- (3) The national state.
- (4) The historical attitude.
- (5) Mass education.
- (6) Democracy.
- (7) Individualism.

(1) *Natural science.* Our culture has been the scene of the most thoroughgoing and most successful attempt ever made to interpret the whole order of nature in mechanico-causal terms. In comparison its nearest competitor, the Epicurean atomism, seems the work of childish play.⁸ Natural science, the most superb monument of western civilization, is worthy of standing unashamed beside the medieval cathedral, Greek philosophy, Buddhist and Hebraic religion, and Chinese common sense—other great constructions of other times that have come down to us. The question, it should be clear, is not one of the truth or falsity of such things, but of their magnificence and grandeur. They are, each one, master creations of the imagination, working within set terms, elaborating each according to its lights an all-embracing world view, capable each in its own way of warming the hearts of men. It is only when one such thing is praised to the exclusion of others that men lessen their patrimony.

The presiding genius of modern natural science is mathematics, and its great aspiration is to state the relations of natural objects to each other in the most general and abstract terms. The ideal consummation would be a single formula of absolute clarity which fully described every possible natural situation. Guided by this ambition, a succession of great men have sketched the outlines of a system of conceptions which unites into one orderly whole all terrestrial and all heavenly motions. The whole furniture of heaven

and earth is made to tell the same story—a story that is summed up in three almost obviously simple laws of motion and the single principle of universal gravitation. It is not beyond the possibility of doubt that the whole reach and extent of this great scheme shall some day prove inadequate; it is more than likely that the time will eventually come when it shall be cast aside in favor of some other construction elaborated upon quite different bases: this alone is certain, that nothing the future may hold will diminish its august splendor.

Perhaps the chief influence of natural science upon our lives is to be found in the way it molds our thinking. We are trained under its influence to expect things to have causes, and we tend to remain placid in the face of novelties until their causes have been disclosed. Such confidence in regularity and order, however precariously it may be founded, helps greatly in making us feel at home in the world. We are led to minimize the possibility of events that run counter to the established uniformities. This attitude has not penetrated the life of our times very deeply, it is true, for the ignorant awe of science is felt much farther than its spirit, but it has touched the lives of many individuals throughout western civilization.

(2) *Mechanical invention.* No other culture depended so completely on machinery, and no other culture ever so thoroughly controlled the power resources of the globe. We live in the midst of a great industrial civilization, and we are almost inundated by its outflow of manufactured goods. When city-dwellers look about them, their eyes seldom fall upon anything made entirely by hand, and still less often on objects existing just as they came from the mint of nature. A large part of the surface of the earth has been artificialized—we cover one part with macadam, we dig out another, we fill in a third. We keep trees from growing in one place, and try to make them blossom in another. We have machines to make machines, and yet other machines to take care of these, until it has been suggested, only half fancifully, that some day the machines may get the upper hand and make us their slaves.⁹

In a culture like ours economic considerations become paramount, and tend to drive all others into the background. It was in the midst of our industrial civilization that Karl Marx framed his famous economic interpretation of history, which states that in all ages the social structure is determined throughout by the then existing methods of production and exchange.¹⁰ Such a view, however grotesque it be when applied to all cultures everywhere, holds more than a shadow of truth when our culture alone is considered. Whether valid or not, the theory is in itself a sufficient indication of the degree to which the machine has entered the mind of man in our own day, for many others besides Marx have been led by the pressures of our culture to conclude that his economic interpretation of history was sound.

(3) *The national state.* Everywhere throughout the western world men live today in aggressive national states. The old Roman Empire was international, for it contained peoples of many affiliations who were united only by virtue of the fact that they lived under the *pax Romana*. The national state aims to include within its boundaries all individuals of one blood, or all who are thought to be of one blood, and at the same time it aims to secure the utmost possible extension of its national territories. The feeling of nationality is really a very recent phenomenon. In many parts of Europe it was a by-product of the French Revolution, and in yet others it did not appear until much later. In central Macedonia as late as 1878, for example, the peoples can hardly be said to have belonged to any nationality. Thirty years later the region was a little hell-hole of conflicting and bickering peoples full of militant and sundering patriotisms, thanks to the propaganda of Serbs, Bulgars, Greeks, Albanians, Rumanians, Turks, Austrians, Russians, who endeavored to attach the Macedonians to their various groups; and a bitter fruitage of atrocities and outrages was reaped in the Balkan Wars of 1912-13—to say nothing of the intimate connection of “the Balkan problem” with the Great War itself.

The chief psychological aspect of nationalism is the senti-

ment of patriotism. It is natural, and no doubt a good thing, that a man should treasure tender feelings for the place where he has lived and the people with whom he has associated. Such feelings work their way deeply into all but the most insensitive creatures. But patriotism often overreaches this pious and ennobling affection, and becomes a fanatic and exclusive loyalty to one's group, or to the commands of an impersonal and irresponsible state, and it must then be recognized as one of the world's greatest dangers. Who does not remember Decatur's famous toast—"Our country! May she always be in the right, but our country right or wrong"? Nationalism in fact is the modern man's real religion, and he offers himself as a living sacrifice to his group with the same devotion that saints once laid their lives upon the altars of God. The feeling, no doubt, is a fine one, and deserves unlimited respect; but its fruitage in our world in the way of national jealousies, rivalry, and war are to the last degree deplorable.

(4) *The historical attitude.* The modern man attempts to explain almost everything by a reference to its past. He studies the origins of religion in order to find out what religion really is; he looks up his family tree so that he may know his own worth; he consults the founding fathers when he cannot decide whether his country should join the League of Nations; he erects statues of frock coated gentlemen in his parks, places memorial tablets on trees and buildings, decrees national holidays, plans pageants of his country's history, creates legends centering around the national heroes, and in many other ways continually reminds himself of the generations that have gone before. Not all of this is new, for men everywhere have memories, but in our culture the sense of time has become so vivid that one author has written of "the living past."¹¹ The ancients wrote histories, and good ones, but for the most part they recorded events which were almost contemporary, and many of their best historical writings are really annals or glorified diaries of what went on from year to year within the group. We probably know much more about the early history of ancient Egypt than did the Egyptians, and we have gone so far as to construct a

prehistory which tells the story of what may have happened before the period when written records were kept.

Our study of the past is carried on in every conceivable manner. We write histories of matrimonial institutions, of wall paper, of the solar system, of the problem of evil, of literature, of commerce, of prize fighting, and indeed of everything. Our culture is so flooded with fact and speculation about the past that we can hardly move without running into a precedent. At the same time, however, the abundance of materials greatly quickens the imagination of many persons, and provides them with suggestions for the control of problems they might not otherwise be able to handle.

Although the historical attitude was largely a creation of the eighteenth century—witness the brilliant philosophies of history that date from that period—the great success of Darwin's work in the third quarter of the last century is clearly the chief single reason why contemporary thinkers place such emphasis on origins. The modern belief in evolution was not created by Darwin, for many thinkers in the hundred years preceding his researches had taken the idea for granted, and in one way or another had attempted to describe the processes involved. Darwin it was, however, who first marshalled a great array of facts behind a particular explanation which is adequately summarized in the title of his great work—*On the Origin of Species by Means of Natural Selection, or the preservation of favored races in the struggle for life* (1859). After the storm of battle had cleared away, Darwin was left in possession of the field, thanks both to the encyclopedic persuasiveness of his book and to the ceaseless polemics of Herbert Spencer and Thomas Henry Huxley in favor of the idea. Since then men have been unable to think in quite the same way about themselves, and they have also been led radically to reinterpret their world so as to fit it more nearly into the great concept of development.

Another idea, considerably older than the modern theory of evolution, though still largely a creation of western civilization, was given a great impetus by the triumph of the evolutionary position, especially as it was preached by

Herbert Spencer. This is the idea of progress. In its contemporary forms it hardly seems to have been known to the ancients.¹² It is true that the Greeks thought of all things as pressing towards an end or purpose, but the end of a thing was to realize its own destiny, to become truly itself, and not something else. Thus the story of the acorn was finished, and it had properly completed itself, when it finally developed into an oak. Every species or natural kind in similar fashion had its own peculiar excellence towards which it strove. In the main the Greek view was natural and straightforward, though the Greeks sometimes imported human prejudices into their interpretations, as when Aristotle stated that the *telos* or end of a stone was to become a doorstep. This remark has probably made many a stone smile—in its stony way.

The modern view of progress must also be distinguished from the Christian notion of the after life, with which it is connected, but which long predates it. The Christian view is not that of a slow and orderly development in the course of which the future grows imperceptibly but surely out of the past. It rather envisages an overwhelming cataclysm in which time suddenly comes to an end, judgment is instituted, and a new order inaugurated to endure in changeless splendor throughout eternity. The poet, when he spoke of the

One far-off divine event
To which the whole creation moves,¹³

probably muddled in his mind the evolutionary viewpoint and that achievement of angelic perfection which is held to be the portion of the good Christian on the other side of the grave. It is rather to persons like Nietzsche that we must go for a downright apotheosis of progress seen in the light of evolutionary conceptions:¹⁴

And Zarathustra spake thus unto the people:

“*I teach you the Superman.* Man is something that is to be surpassed. What have ye done to surpass man?

“All beings hitherto have created something beyond them-

selves; and ye want to be the ebb of that great tide, and would rather go back to the beast than surpass man?

"What is the ape to man? A laughing-stock, a thing of shame. And just the same shall man be to the Superman: a laughing-stock, a thing of shame. . . .

"I love those who do not first seek a reason beyond the stars for going down and being sacrifices, but sacrifice themselves to the earth, that the earth of the Superman may hereafter arrive."

Comparatively few of us are bold enough to cherish a view like this. We rather prefer to think of ourselves and our kind as continuing on, without essential change, while we slowly better ourselves with the passing of the days. We do not like to think of ourselves and our life merely as raw materials for a different order of existence, though the idea of progressive improvement towards a smug perfection is attractive.

Culture history offers not the slightest evidence in support of a general theory of progress. The past is strewn with the wrecks of cultures which flourished, had their day, and disappeared, leaving only remnants of their former glories for later cultures to salvage and wonder at. The same great fact of reckless abundance and tragic disappearance is brought home to us if we confine our attention to the past of our own culture, for the most casual inspection reveals, not one progress, but many distinct progresses and retrogressions all intermingled. Not all parts of culture move in a single direction, for many institutions are getting nowhere, and some are busy destroying their own chances of development and fruition. It is a melancholy fact that many of the great achievements of human history have not been preserved for the pleasure and advancement of mankind, but have had their little day and perished ignobly into dust. The question as to whether progress has occurred in a given field cannot be settled by general considerations, but must rest upon special investigations into the pertinent materials.

(5) *Mass education.* We regard education as a panacea for all the ills that man is heir to, and prescribe it in liberal

doses to the younger members of our group. The type of education modern thinkers advocate extends far beyond the basic training which is necessary or advisable in order to fit a child for entrance into the activities of our culture. It includes some things of that kind, as elementary language study, elementary number study, and a minute amount of elementary hygiene study, but it contains many other things as well. The content of the curriculum, both in the lower schools and in the colleges, consists essentially of "subjects"—that is to say, of abstract collocations of principles and illustrations, drawn together rather for convenience in presentation than for ease of learning. A considerable part of our educational endeavor is therefore devoted to practice in the skillful manipulation of words.

Perhaps the chief reason for our difficulties in the field of education comes from the fact that we have not yet learned how to use the printing press. The invention of printing was undoubtedly a great thing in the life of the western world, and it has affected nearly everything that we do.¹⁵ We shall here mention but one point (see the bibliographical reference just given for others equally worthy of discussion), namely, the altered connotations attached to *knowledge* as a result of the wide dissemination of great masses of printed matter. Knowledge is more and more conceived of in terms of book acquaintanceship with things, and more specifically as familiarity with odds and ends of information. Indeed, the greater part of what we call knowledge is really just useless information which we hope will somehow prove useful at a later juncture.

It was perhaps the invention of printing as much as any other thing which made the ideal of universal education seem feasible, and although great difficulties still stand in the way, it is encouraging to note the resolute manner in which educators are facing them. The time may yet come when books will be used in the course of education without making the education itself bookish.

(6) *Democracy*. Ours is a world in which every man is as good as every other—"or even better," as Mr. Dooley once said. This at least is the prevailing theory, although the

greatest inequalities of social status and of opportunity exist in our society. Politically, if not economically, all men are free and equal—that is, every man is allowed to cast the same kind of ballot on election day. Many still believe that the magic of political arithmetic involved in counting these ballots will tell us what is best for the state, although others (less optimistic) are no longer moved by the enthusiasm which democracy so profusely generated in its earlier days, and now regard democratic institutions as an inevitable and necessary makeshift in government. They feel that democracy is with us to stay, at least for some time, and that we must make the best of it. And so serious students of government are casting about for devices and schemes that will enable the people to discharge the functions of government more effectively within the limits of democratic institutions.¹⁶

(7) *Individualism*. In two ways the course that western civilization has taken during the last century or two has deeply affected the notions we form as to our own inner selves, although on the one hand this influence runs directly counter to recent developments in biology and the social sciences, while on the other it is clearly contrary to the known principles of mental hygiene. We naturally tend to regard ourselves as distinct and separate individuals, and we have come to be almost abnormally self-conscious. These points will be discussed separately.

The feeling that we are distinct individuals, bound only by external ties to other persons and to our group, is a part of the heritage of the social science which men created in the eighteenth century, on the model of the already developed natural sciences, and which was used to free the rising industrial and commercial bourgeoisie from mercantilistic governmental interference with business. The earlier natural sciences developed in terms of simple elements (masses, forces, motions, etc.) had been tremendously successful, and so thinkers who hoped to create social sciences inspected their subject-matter with a view to finding its simple elements. These elements, the social scientists rather naturally concluded, stood ready and available in

the individuals who composed the group. Individuals obviously did seem to be the separate and elementary components of society, and in addition Christianity had named individual souls as units to be separately saved or damned. And it was just these individuals also who were clamoring for the government to leave them alone in their commercial and industrial enterprises. It is not strange, therefore, that political scientists tried to show how previously isolated persons had come together at some time in the past, and by a social contract had created the social order; that political economists argued that if each man were left to consult his own private interests, the interest of all would be served, (provided only the government did not foolishly interfere); and that philosophers elaborated systems which explained how we happened to have knowledge of a common world, although we were each one of us hidden away in his own private shell.* The net result is that most modern men regard themselves as self-sufficient individuals with minds of their own. Any reader of this book who confesses to even the faintest approval of its general spirit will realize at once that this notion stands in urgent need of revision.

Now for the second point: we are exceedingly self-conscious. We are always analyzing our symptoms, introspecting to determine our precise feelings with respect to this, that, or the other experience, probing to find out just why stray thoughts have floated through our heads, guessing as to the hidden motives and obscure drives that determine our conduct, wondering how near we are to being "abnormal," arguing back and forth with ourselves over matters of slight importance. The popularity of psychoanalysis, the vogue of the psychological novel, our interest in biog-

* It would be possible, though not profitable here, to push the analysis back a bit further. The chief ground for the confusion that has reigned in the social sciences ever since they were founded rests on the fact that they have tried to do business with two radically different sets of categories, the one derived from modern physical science, the other coming down into modern times from the medieval period, and ultimately in large measure from Aristotle and the Greeks. The development of modern biological and anthropological science, as well as recent tendencies in physics, may eventually put an end to this confusion.

raphy and in "human nature," our mannerisms and mechanisms, all show this leaning of the modern mind. Consider the following passage from Logan Pearsall Smith's little book on the English language:¹⁷

Perhaps the most characteristic of all these modern adjectives is the word *interesting*, which is put to so many uses that we can hardly imagine how life or conversation could be carried on without it. And yet *interesting* is not found before the XVIIIth Century, when it first meant "important," and its first use with its present meaning appears, characteristically enough, in Sterne's *Sentimental Journal*, published in 1768. About the same time the verb to *bore* appeared; and we who are so often *bored*, or *interested*, must, if we wish to enter into the state of mind of past ages, try to imagine a time when people thought more of objects than of their own emotions, and when, if they were bored or interested, would not name their feeling, but mention the quality or object that produced it. This change is a subtle and yet an important one; it is due to our increased self-consciousness, and our greater sense of the importance of the inner world of feeling. One of the latest products or by-products of this change is the modern habit of taking a conscious pleasure in our own emotions. This "sentimental" attitude is well dated for us by the appearance of the word sentimental itself about the middle of the XVIIIth Century. It soon became fashionable; and, carried abroad by Sterne's *Sentimental Journey*, it was borrowed by the French, and translated by the Germans.

Self-consciousness is one of the most aggravating of human vices, and the source of many minor mental maladaptations. Max Eastman for this reason, no doubt, calls the self a "pearl of adult degeneration."¹⁸ It stands at the bottom of nearly all of our insincerities and nauseating self-displays.

Sometimes after a brilliant literary meeting where authors read their papers our heart goes out to the simple and spontaneous, natural and single-minded cow, who never flourishes her tail for our sakes, but to remove from her actual haunches an authenticated fly.¹⁹

It is by no means desirable that more than a very small

part of our life processes should ever be brought to full consciousness. Natural and healthy activity takes many things for granted, and is not continually turning in on itself to feel its pulse and see if the wheels are still going round. Samuel Butler was fond of pointing out that whenever nature wants a thing really well done, she always takes pains to see that it is unconsciously performed.

Difficulties in judging a culture

Nearly all of us feel uncomfortable when we are thrown among foreigners. Strangers are people who are strange, and who make us feel strange. They act and think differently; and, still worse, they have different ways of feeling. It has been well said that the man who tries to be funny in a foreign land is almost certain to insult or disgust or annoy or shock someone.²⁰ Every man's own ways feel warm to him, while the habits of others leave him cold or hostile. Thus we all naturally have a strong bias towards our own customs, and sometimes more than a little contempt for the other fellow's. This contempt is likely to be unconcealed when we compare ourselves with people whom we are accustomed to regard as inferior, and especially when we compare our civilization with the so-called lower cultures. The Greeks called all non-Greeks barbarians; and it has been suggested that the word was coined as a name for the person who said "ba-ba-ba-ba"—that is, for the man who spoke a strange language. We should not allow a prejudice against barbarism or savagery to darken our appreciation of these cultures; we should remember that an equal portion of contempt from others will no doubt be our portion, since there is no good reason to suppose our culture will last forever.

We often find it hard to form sound judgments of the value of a particular culture (especially our own) because we credit it with the good qualities common to all cultures. To live in any society at all is a great boon. We are sometimes naïve enough to turn praises of society in general into acclamations of our own particular way of living. The great Edmund Burke himself fell into this fallacy, when in glowing words he pointed out that society

is a partnership in all science; a partnership in all art; a partnership in every virtue, and in all perfection. As the ends of such a partnership cannot be obtained in many generations, it becomes a partnership not only between those who are living, but between those who are living, those who are dead, and those who are to be born.²¹

Society is exactly this; but how from such praises of society could Burke conclude (as he did) in favor of the existing régime in his own country, or against the revolutionists in France?

Another reason why it is difficult to estimate the value of our culture arises from the fact that it so clearly works. Many people are living under the conditions it provides, and yet other hosts have lived and died under its auspices far back into a dimly receding past. But in all soberness it must be remembered that every culture and every institution has worked; people have always lived in some fashion, whatever the social arrangements. To say that the present scheme works, then, is only another way of saying that it is here. Before settling the merits of a culture or an institution, we must inquire into the conditions under which it works and the results that it secures.

The prevalence of evolutionary modes of thought leads many to conclude that our culture must be the best, since it stands on the very crest of time. Aside from the fact that other cultures also exist at the present moment, and on this basis are entitled to equal consideration, such complacency is very cheaply won, for, as we have seen, evolution has no necessary connection with progress, and still less with human progress. Vast stretches of the history of this planet are given over to the laborious exploration by various life-forms of what from our point of view must be regarded as blind alleys, and we have no assurance that human beings are not engaged in a similar occupation. In addition, many types of creature alive today (human beings included) are, from any evolutionary standpoint, of low and degraded quality. In man himself there remain vestigial organs which are only inadequately capable of performing their present functions, if indeed they have any. Further, it is

by no means clear that evolution aimed at producing man, or that it had any aim at all. The theory of evolution covers far too long a period of time (probably about 500,000,000 years so far as life is concerned) to be of much use in interpreting or evaluating the few thousand years of human history.

Bertrand and Dora Russell in a recent book entitled *The Prospects of Industrial Civilization* have discussed this question of criteria for judging a social system wisely and humanely.²² After a consideration of a number of erroneous methods, two questions are named as basic: Does the culture give present well-being? Does it show capacity for developing into something better? The conclusion is as follows:

For my part, I should judge a community to be in a good state if I found a great deal of instinctive affection rather than hatred and envy, a capacity for creating and enjoying beauty, and the intellectual curiosity which leads to the advancement and diffusion of knowledge.

The ingredients of a good community are summed up by these authors as happiness, friendship, enjoyment of beauty, and love of knowledge. Such an answer to the problem of what constitutes a good society is of course not perfectly definite, and leaves much room for discussion, but it seems to turn attention in the right directions. The chief value of a culture is not to be found in its complexity, its extent, or even its power, but rather in its ability to provide its members with facilities for the good life.

REFERENCES

¹ I was helped to make this analysis by F. C. Müller-Lyer, *The History of Social Development* (London, Allen and Unwin, 1920), although I do not subscribe to the theory of phases there enunciated.

² See Adam Smith's classic, though now antiquated, discussion of this point at the beginning of his *Inquiry into the Nature and Causes of the Wealth of Nations* (1776).

³ E. S. Ames, Social consciousness and its object, *Psych. Bull.*, Vol. 8 (1911), 415.

⁴ *Wealth of Nations*, Book I, Chapter I.

⁵ Thomas Paine, *Common Sense* (Works, Vol. 1, 69).

⁶ Edward Carpenter, *Civilization; Its Cause and Cure* (13 ed., London, Allen

and Unwin, 1914), 1, 47. See also Stanton Coit, *Is Civilization a Disease?* (Boston, Houghton Mifflin, 1917).

⁷ It is excellently recounted in J. H. Randall, Jr., *The Making of the Modern Mind* (Boston, Houghton Mifflin, 1926). See also F. M. Stawell and F. S. Marvin, *The Making of the Western Mind, a short survey of European culture* (London, Methuen, 1923), and J. H. Robinson, *Mind in the Making* (N. Y., Harpers, 1921).

⁸ Cf. Lucretius, *De rerum natura*, trans. by Monro, by Bailey, or by Leonard.

⁹ Samuel Butler, *Erewhon, or Over the Range* (1 ed., 1872; revised ed., 1901) Cf. also Gareth Garrett, *Ouroboros, or The mechanical extension of mankind* (N. Y., Dutton, 1926).

¹⁰ Cf. Karl Marx and Friedrich Engels, *Communist Manifesto* (1848).

¹¹ F. S. Marvin, *The Living Past; A sketch of western progress* (3 ed., Oxford, Clarendon Press, 1917).

¹² J. B. Bury, *The Idea of Progress; An inquiry into its origin and growth* (London, Macmillan, 1920).

¹³ Alfred Lord Tennyson, *In Memoriam*, last stanza.

¹⁴ Friedrich Nietzsche, *Thus Spake Zarathustra*, 27-30 (Modern Library ed.).

¹⁵ See A. C. Barnes, *The Art in Painting* (N. Y., Harcourt, Brace, 1926), 241-242, for a statement of the effects of printing on painting. See Victor Hugo, *Notre Dame de Paris*, Book 5, Chapter 2, for a classic account of how printing displaced architecture as the central art of western culture. Cf. R. W. Livingstone, *The Legacy of Greece* (Oxford, Clarendon Press, 1921), 266, for an explanation of differences between Greek and modern literature in terms of the influence of printing.

¹⁶ Cf. Walter Lippmann, *Public Opinion* (N. Y., Harcourt, Brace, 1922); also his *The Phantom Public* (N. Y., Harcourt, Brace, 1925).

¹⁷ Logan Pearsall Smith, *The English Language* (Home Univ. Library), 247-248.

¹⁸ Max Eastman, *Colors of Life; Poems, songs, and sonnets* (N. Y., Knopf, 1918).

¹⁹ F. M. Colby, *Imaginary Obligations* (N. Y., Dodd, Mead, 1910), 39.

²⁰ John Palmer, *Comedy* (N. Y., Doran, 1914), 5.

²¹ Edmund Burke, *Reflections on the Revolution in France* (ed. by Selby, London, Macmillan, 1902), 107-108.

²² Bertrand and Dora Russell, *The Prospects of Industrial Civilization* (N. Y., Century, 1923), 142-162. The quotation is from page 162.

PART II

HOW WE COME TO BE WHAT WE ARE

Chapter IV

GENERAL PHASES OF HUMAN DEVELOPMENT

Natural basis of experience

Science has taught us to believe that we live in an exceedingly complex world, however simply we may be in the habit of regarding it. Many things are happening even in an empty room. Every particle of matter in the room (and their number far surpasses the grasp of our imaginative powers) is bound by the invisible chains of gravitation to every other particle, so that the slightest displacement of one particle, were it ever for a moment still, would immediately set all others into restless movement towards a new equilibrium. But as a matter of fact the particles are never at rest, but instead keep ceaselessly shifting about at a speed quite beyond our comprehension, while at the same time they are forever emitting impulsions into space which, traveling at some 186,000 miles per second, are reflected back and forth, hither and yon, until the room is a perfect maze of paths and counterpaths. Nor is this all, for the tiny particles are curiously and wonderfully arranged into larger groups, and these too are also in ceaseless motion and are also emitting impulsions, which travel at about a thousand feet per second, and are in turn reflected and re-reflected without intermission. Nor, again, is this all, for in our room substance is acting on substance—wood is slowly decaying, iron is rusting, varnish and paint are silently combining with the materials to which they were applied, pottery is changing its composition—in truth all things composing this little world of a room that we have imagined are in ever-changing flux.

Into all this boundless confusion and chaos of motion and counter-motion there walks a man, and we eagerly note what is to happen, for he too is a remarkable summation of diverse energies. Speaking roughly, two somewhat different though intimately associated types of interaction can be distin-

guished when a human being enters a room: (1) he at once affects and is affected by many of the processes already going on in the room; (2) he undergoes certain conscious experiences, which seem to differ qualitatively from the processes already described, and so are added, as it were, to the totality of activities previously exhibited in the room.

(1) Quite apart from any knowledge or awareness on his part, our man on entering the room deflects and disturbs the intricate relationships there established. Bombarded on every side by its restless energies, and being himself also a system of ever-changing forces, innumerable adaptations and movements towards a new equilibrium are initiated, and in this process the man himself is to some degree altered, and to some degree alters everything else. These adjustments between the organism and its environment may be carried very far indeed without necessarily invading the field of knowledge or awareness. They may be carried even to the point of the extinction of life itself, as when a sleeping man slowly inhales a deadly gas and dies without knowing that his time has come.

(2) But human beings in many situations do undergo certain more or less conscious experiences which constitute a distinct addition to the sum of existences. In the instance we have imagined, we may think of our man as seeing the four walls of the room, with the light streaming in through the windows, and we may suppose that he hears a few sounds from out of doors. This may seem like little enough, but it is indeed a great deal, for before the man came in, the room contained only particles of one sort or another in various relations, and now it contains colors and sounds. The basic vibrations and particles are probably completely ignored, but our man can hardly avoid paying some attention to the colors and sounds.

Where do these colors and sounds, and all the other qualities of experience, come from? They are apparently a result of the bombardment of a nervous system by the forces and energies of the world. If he had no nervous system, a man would still be in intimate contact with his environment, but he would have no conscious experiences—

he would be aware of nothing. A short description of the nervous system is therefore necessary on account of its importance in our story. The cells of which it is composed are called neurones. They are found in the brain, in the spinal cord, in certain ganglia or groups situated outside the spinal cord, and as fibriles or processes extending out to all parts of the body, where they are in connection either with sensory nerve endings or with muscle fibers or glands. Neurones are not intimately welded together anatomically, but are separated by synapses or gaps, which nervous stimulations must be strong enough to cross. The situation at the meeting point of two neurones is usually something like that when the branches of two trees intertwine and touch, or nearly touch. Taken collectively these neurones are the channels of all experience. If anything ever happens to the body without affecting neural paths, we never get wind of it. We could be burnt to death without ever knowing it, were it not for the functioning of the nervous system; anæsthetics are drugs with the power of decreasing the sensitivity of portions of the nervous system; sleep is a condition in which the sensitivity of the nervous system in some manner is lowered.

The nervous system has often been compared to a complicated telephone exchange. This analogy drives home one very important truth—that all communication within the body goes on through nervous pathways.* The brain and spinal cord play the part of the central exchange in the telephone system. The regular course of stimulation, then, is as follows: A set of physical changes in the environment acts upon a group of sensory nerve endings, and causes them to transmit impulses through the incoming or sensory nerve processes to the spinal cord, where one of two things may happen: (a) (with the simpler forms of reaction) impulses are generated in outgoing or motor nerve processes and transmitted to muscle fibers or to glands, which are thereby

* Two exceptions to this rule must be mentioned: (1) Certain of the glands release secretions directly into the blood stream, which eventually carries them to the organs they are capable of affecting; (2) parts lying next to each other undoubtedly affect each other by purely physical pressures.

caused to function; (b) (with the more complicated forms of reaction) the impulses are carried by one or more central nerve processes up to the brain, where they generate other impulses in central nerve processes which travel down the spinal cord, are transmitted to outgoing nerve processes, and in turn cause the functioning of muscles or glands.

The whole cycle of incoming (sensory), central, and outgoing (motor) processes is called a *reflex arc*. Reflex arcs always act as units. The reflex arc concept is absolutely

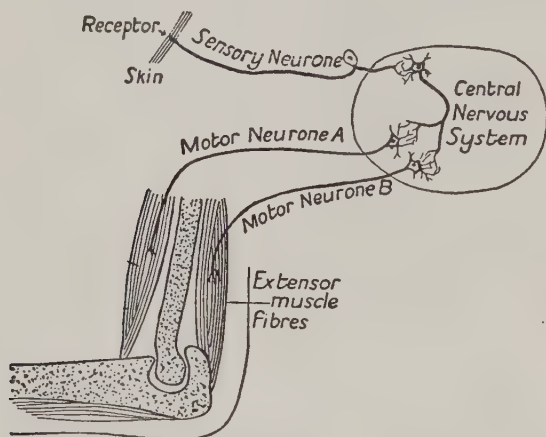


FIG. 3. Diagram illustrating simple reflex arc. The impulse is transmitted from the sensory cell (receptor) at the surface of the body, through the spinal cord to the motor neurones A and B, thereby causing the muscle fibers to contract and the limb to move. (From Dakin, *The Elements of General Zoölogy*, London, Oxford Univ. Press, 1927, p. 270.)

fundamental to an understanding of the operation of the nervous system; it states that the nervous system is never activated except through the joint coöperation of stimuli, sensory processes, central processes, and motor processes. A muscle, for example, is totally incapable of acting all by itself; it must be excited to action by impulses that reach it through the stimulation of one or more reflex arcs.* Nor

* The minute parts of a muscle are, of course, separately alive, and exhibit all of the characteristics of living things discussed in Chapter I; but the activity of these tissues is an interaction dependent upon and in part elicited by external stimulations. For this conjoint action the activation of reflex arcs seems to be necessary.

does thinking take place in any other manner; all mental activity goes back to the stimulation of reflex arcs. The

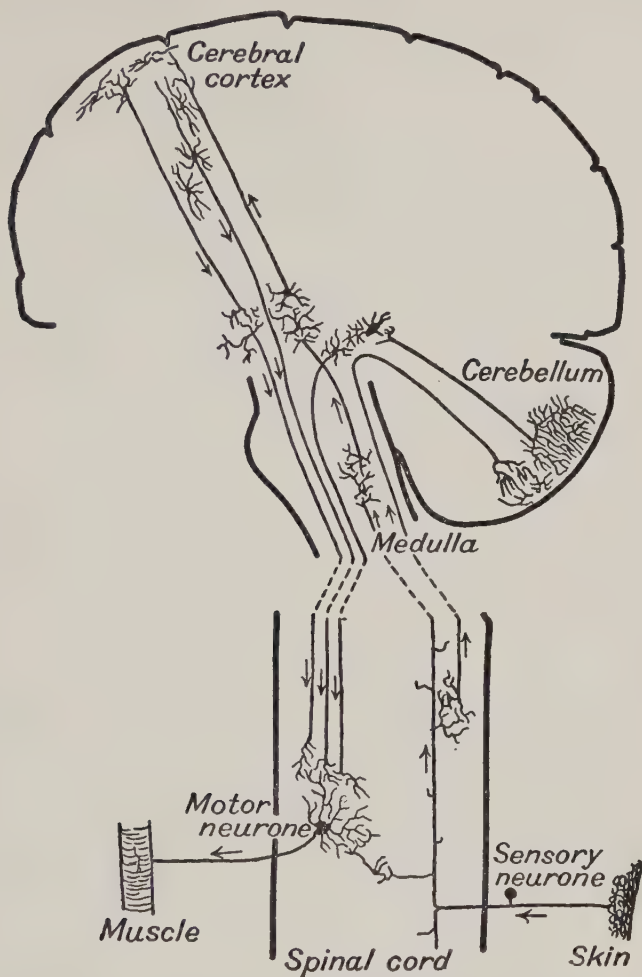


FIG. 4. Diagram indicating neural pathways from a sense organ in the skin to a muscle. A variety of different pathways, some involving one or another part of the brain, are shown. (From Smith and Guthrie, *General Psychology in Terms of Behavior*, N. Y., Appleton, 1921, p. 29.)

accompanying diagrams (Figs. 3-5) should be studied with great care; they indicate in a highly simplified and schematic

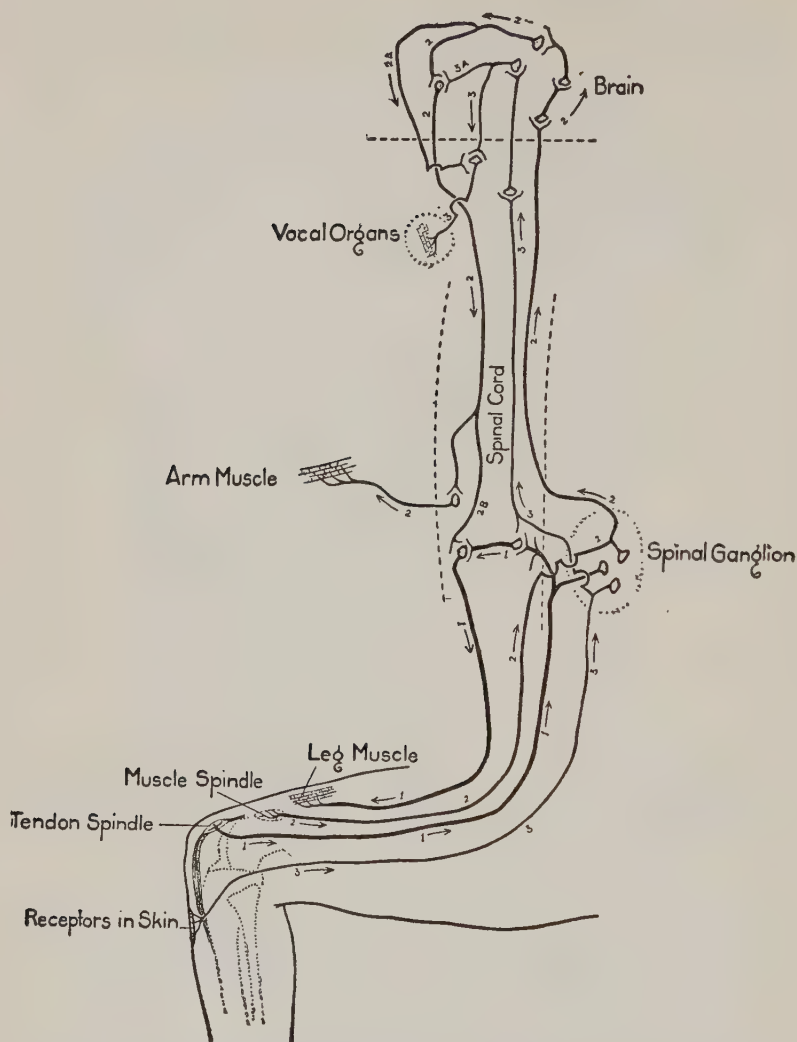


FIG. 5. Diagram indicating some of the neural pathways involved in the knee-jerk (the reflex set off when the crossed leg is lightly struck just below the knee-cap), and in the accompanying perceptual reactions. 1 is the arc over which the reflex occurs; 2 is an arc over which occurs the reaction of perceiving the movement; 3 is an arc over which may occur the reaction of perceiving the blow (*i.e.*, the stimulus). All these reflexes (in addition to many others) may be in operation at the same time. (From Dunlap, *Elements of Scientific Psychology*, St. Louis, Mosby, 1923, p. 191.)

fashion how the different parts of the nervous system inter-function.

The following is a classified list: (1) of our sensory organs, *i.e.*, of the doors of *entrance* for stimulations to reflex arcs; (2) of our motor organs, *i.e.*, of the doors of *exit* for stimulations from reflex arcs: ¹

- (1) Organs of touch and pressure; of sensibility to cold and to heat; of pain; of general chemical sensibility; of hearing, vision, smell, and taste; organs of muscular, tendon, or joint sensibility; sense of equilibrium; organs of hunger, of thirst, and of nausea; organs giving rise to respiratory, to circulatory, to sexual, and to cavity distention sensations; organs of visceral pain; organs of abdominal sensation connected with strong emotions.
- (2) Organs on skeletal muscles, on visceral muscles, on glands, and on special visceral end-organs.

From this list it can be seen that we possess many more than the traditional five senses. The sense organs are the only possible points of entrance into the nervous system, and therefore the only feasible channels for the having of conscious experiences.* A person, then, can be *affected* by the environment without being aware of the fact (except possibly indirectly), either because some environmental energy has acted directly upon a bodily part without stimulating the nervous system, or because the sensory endings have been too slightly stimulated; but conscious experience is a result of the stimulation of reflex arcs, and the entrance to these is through sense organs. It is not easy to say just what is going on when we are having a conscious experience, and the process undoubtedly differs considerably from one sense to another. Much coöperation between the organism and its environment is required for even simple experiences. The eye, for example, does not take a little picture of its object, and then telegraph it back to the brain over the nerves for

* This is strictly and absolutely true as regards every-day experiences, but there are nevertheless certain possible exceptions. Thus it is possible to stimulate the nervous system directly, without the intermediation of sense organs, either by baring the incoming sensory nerves and stimulating them, or by cutting open the skull at some point, and stimulating the bared cortex of the brain.

it first to be looked at and then neatly filed away in some pigeonhole for future reference. Seeing is a process which goes on quite as much out in the world where the object is located as in the eyes or inside the head; objects to be seen are quite as essential for vision to occur as are eyes with which to see them.

The various senses differ widely in their natures and possibilities. Thus pain unequivocally directs attention to itself, while vision minimizes its own activity, and therefore creates the impression that it reveals things exactly as they are. As a matter of fact, the eye probably makes as many mistakes as other sense organs. Vision remains aloof from its object, and this, in combination with its apparent truthfulness, is probably the chief reason why philosophers of all ages have tacitly taken vision to be the distinctively intellectual sense, with hearing, another distance sense, coming next in importance. Objects experienced through the sense of touch are always near at hand; so when doubts are raised concerning the declarations of sight or hearing, we usually turn if we can to touch as the final arbiter. Sight and hearing, interestingly enough, are also apparently the chief esthetic senses, although the place of muscular and visceral (internal) components in the esthetic experience might reward further investigation. If highly developed sympathy is lacking, experiences which appeal to the ear usually move us more than those appealing to the eye; and in this respect hearing tends to remain the shock sense that it was in the beginning. "We see with indifference a fish in its dying writhings, but we cannot listen to cries of pain without emotion."²

In the course of experience the senses to a considerable degree become adjusted to each other, and thus manage to get along fairly well. If they were ever to unite in telling some story, however false, and were only to stick to it, we should never be able to convict them of their falsehood. Professor G. M. Stratton some years ago performed an interesting experiment in which for a time he wore glasses which reversed up and down, as well as left and right. After some preliminary confusions had been cleared up, he found

it quite natural to reach down for a thing he saw up, to send his hand here for a thing he saw there, and he soon became so proficient under the new conditions that he found normal relationships themselves confusing on first removing the spectacles. He states his conclusions as follows: ³

If we were to see a thing long enough in any given place, we should, sooner or later, also feel it there. If the world had been so constructed that we always saw our bodies a hundred yards away from our point of view, our touch sensations would undoubtedly have taken this same position. The reason for it is this: there is no place in the visual field where we can say beforehand we ought to see something that we happen to be touching. Experience alone can teach us where it will appear. . . . The agreement is therefore a matter of training and expectation. One can learn to expect anything that has been regularly experienced. So that a harmony of touch and sight can grow up under the greatest variety of circumstances, provided merely that the experience remains uniform long enough to develop fixed expectations.*

The situation with respect to our experiences is rendered more complex by virtue of the fact that important parts of the nervous system (collectively called the autonomic system) are to a considerable extent cut off from direct connection with the brain and spinal cord. The autonomic system controls the vital processes connected with breathing, circulation of the blood, and digestion, plays a large part in sex life, and seems to be influential in determining the general feeling tone of the body which goes so far in fixing our temperamental attitude towards life. In the main the autonomic system lies outside the central nervous system, as previously described, but the central portions of its reflex arcs are located in the spinal cord, so that it forms a partially but not completely independent unit. It is itself divided into three sections as follows (Fig. 6):

Cranial section—accelerates digestion and salivation; retards the heart; contracts the pupil; controls bronchial tubes.

* G. M. Stratton, *Experimental Psychology and its Bearing upon Culture*, 149. Copyright, 1903, by The Macmillan Co. Reprinted by permission.

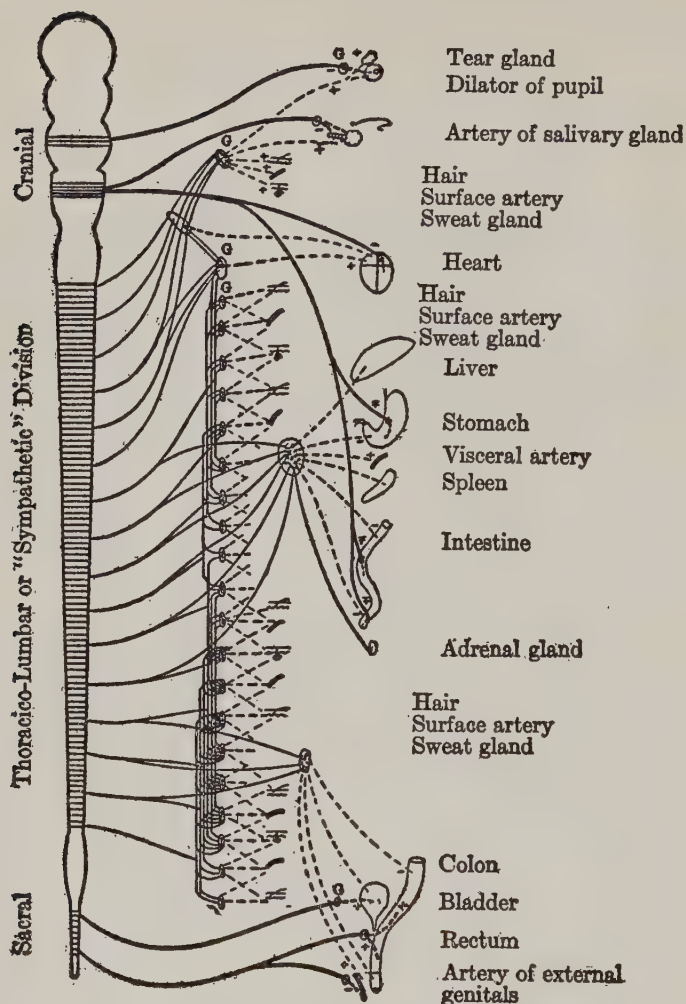


FIG. 6. Diagram indicating the more important connections of the autonomic nervous system. The brain and spinal cord are indicated by the column at the left, the nerves to skeletal muscles not being shown. A + mark indicates an augmenting effect on the activity of the organ; a — mark, a depressive or inhibitory effect. (From Cannon, *Bodily Changes in Pain, Hunger, Fear and Rage*, N. Y., Appleton, 1915, p. 24.)

Sympathetic section—controls sweat glands and blood vessels including those of outer body surfaces; accelerates heart-beat; checks digestive and sexual processes; constricts blood vessels; dilates pupil.

Sacral section—accelerates the operations of the organs of excretion and sex.

In general, then, the sympathetic section of the autonomic system acts upon the same organs as the other two sections, but in the opposite direction. The organs under the control of the autonomic nervous system are just those especially active in emotional excitement, and it may therefore be regarded as the body's chief feeling system. It must not be forgotten, however, that the effects of the movement of muscles are also felt, and that these strains contribute to the total excitement which we call an emotion, although muscles, of course, are innervated by the central nervous system.

The world of the child

The child at birth is a wriggling, kicking, necessitous organism, absolutely dependent on other persons for the satisfaction of its needs. A baby spends most of its time sleeping and eating, and during its few waking moments it seems only casually interested in what is going on. In a famous sentence, William James stated that "the baby, assailed by eyes, ears, nose, skin, and entrails at once, feels it all as one great blooming, buzzing confusion."⁴ This graphic statement should not lead us to believe that the child's primary experience is one of chaos, for all indications point in exactly the opposite direction. If the infant were an adult accustomed to meaningful experiences, no doubt the experiences he actually has would seem confusing. But since he is only a baby, and is entirely unacquainted with the possibilities of his situation, what goes on in and around him can hardly be confusing or irregular. His world is no doubt just as orderly as our own, if not more so, though it contains fewer elements, and these are certainly not experienced as they will be later on. It has already been indicated that, when a man opens his eyes in the hurly-burly

world of vibrations, he sees, not confusion, but colors. So too with the infant; at no time is he in any special sense aware of being an incomplete experiencer, nor is he really one, for he is having all the experiences possible with his organs as they are. Most if not all babies are deaf at birth, and their visual range is exceedingly limited, but these deficiencies in the baby's experience do not lead to any sense of incompleteness or confusion. In fact, it might rather be said that the baby's life at the beginning suffers more from monotony than from distraction.

The baby's initial repertoire of experiences is comparatively narrow, and there is lacking that particular kind of order, control, and self-criticism which we call personality, but there is no sense of deficiency or incompleteness. It takes considerable study and reflection for even an adult to recognize to what an extent his own experience is incomplete. This knowledge is one of the products of mental development, and not its beginning. No gap ever exists in experience simply because something is missing. It has first to be *felt*, and then this feeling of a gap itself bridges the emptiness and completes our mental continuity. In a later chapter some of the gaps in experience which study and investigation have disclosed will be discussed.

The course of development begins neither with simple elements which are slowly associated into more complex objects, nor with an absolute unity which is laboriously broken down, but somewhere in between, and it proceeds at one time towards the combination of experiences, and at another towards the resolution of experiences into their elements. The process of building up more complex experiences out of simpler ones is called *synthesis*, while the process of breaking up complex experiences into their parts is known as *analysis*. In general, processes of analysis at first outnumber processes of synthesis, although this need not invariably be the case. There is more present in the child's early experiences, however, than is necessary for his limited uses, and most early learning consists in the recession of useless elements into the background. As Stern suggests,⁵ the experience from which a perception of his rattle will

eventually emerge is probably to the child for a time an "interweaving" of a shape seen, a noise heard, the movements made in shaking, the general attitude of attentive listening, and perhaps yet other components. From these there eventually emerges, by processes of analysis or dissociation, the rattle of ordinary adult experience. It would be confusing for an adult to have the baby's experience of the rattle, but the baby takes it quite as a matter of course, since other persons are incapable of telling him what he should expect.

General features of mental development

A broad general survey of the course of events whereby the little child eventually becomes a full-grown adult reveals the following processes at work:

(1) *Maturation.* Only a monstrosity could result were an infant to "grow up" by the simple and proportionate enlargement of his existing parts. His bodily structure, both in the mass and in detail, differs markedly from that of an adult, and the manners in which the various parts function together is markedly different. Further, the baby is not born complete, but with the passing of time new parts ripen and take their places in the developing organic structure, while at the same time the functional relationships of already existing parts are slowly altered by other growth processes. The nervous system in particular is not a wholly finished product at birth, but continues to grow for some time thereafter in comparative independence of the specific course of experience. This phase of the process of development is usually called maturation, and is often sharply distinguished from learning; by learning the psychologist means the specific organic effects of specific activities, while he uses maturation to indicate those more general growth changes which are conceived of as occurring independently of any particular happenings, merely because the organism is alive and has not as yet completed its growth. It is believed, for example, that the time would come in the child's life, as a result of the normal continuance of organic development, and apart from any specific training, when he would

be able to walk, and if this be really so, walking is a result rather of maturation than of learning. The most important commonly accepted instance of maturation in the human being is to be found in the emergence of adult sexual powers and interests at the time of puberty, which takes place in our latitudes at about thirteen years for girls and fifteen years for boys.

The time may yet come when all supposed instances of maturation will be dealt with by an appeal to the same principle as psychologists use to explain ordinary cases of learning.

(2) *Greater specificity of response*, both as respects the organism and the environment. The first activities are so diffuse that they are sometimes called "random movements." It is not necessary to suppose that these movements lack perfectly adequate and explicit (though more or less indeterminate) environmental connections. They are clearly reflexes. At the same time, however, they exhibit little or no inner coördination, and they are not conspicuously adapted to the eliciting situation; that is to say, the various movements which accompany the introduction of a foreign body into the orbit of the organism are neither very adequately tied together nor very precisely focussed on the stimulus. When the baby is pricked by a pin, a great slashing about of arms and legs may occur, as well as the emission of sounds and (undoubtedly) some degree of visceral disturbance, but these various motions and activities are but slightly unified, and they rather depart from than center on the pin. The time will eventually come when many, though of course not all, such predicaments will be handled, not by the revolutionary and disruptive measures of the infant, but by the economical mobilization of activities at the place where they will do the most good. When this has occurred responses have become specific, and the infant no longer acts at random.

(3) *Integration of responses*. Some degree of integration is obviously necessary to make possible the processes described above, but the matter goes even further. Entirely new functional relationships may be established when two or

more distinct constellations of random movements, initially of separate occurrence, become tied together or consolidated. Much of the increased skill developed in the course of habit-formation arises from the economies and abbreviations of response that follow upon repeated practice of the same functions. In the beginning, each part movement of the total act had to be finished before the succeeding movement could be started, but after many repetitions the different responses flow easily into each other, the discontinuities and breaks are smoothed over, and the time finally comes when we glide swiftly through the whole series. The act then forms a single unit, as we should soon find out if we were to run through it self-consciously, say for the purpose of showing a friend how to become equally skillful. Athletes who view slow motion pictures of themselves in action are often surprised to find the motions they actually perform differing so greatly from those they imagined themselves to be making. The same remark applies to workmen in various trades whose movements have been analyzed by efficiency engineers.

The tendency for responses to become more highly integrated need not better the conditions under which we live. There are bad habits as well as good ones, and human beings easily become weighed down by every manner of unfortunate association between their responses. Nor should it be thought that unification of response is ever carried very far in most of us. This is shown both by our surprising capacity to improve even the commonest of our habits under intensive training, and by the numberless loose ends and incompletenesses that characterize normal experience. There are, of course, monomaniacs whose every thought and act appears to center around a single point, but even in such cases complete psychic unity is not achieved, for even the severest cases manifest some remnants of "orientation"—*i.e.*, of effective contact with the real world of other people. On the other hand, no individual is ever so completely integrated with his environment as to possess perfect orientation, and forces working in contrary directions will always be found to coexist in each of us.

At the same time the trend of development is usually towards the integration of responses. We sometimes recognize this tendency by developing an ideal of a complete and well-rounded personality which sincerely faces every fact that confronts it and is in entire harmony with itself and its world. Such an ideal is of course unrealizable, although by envisaging it we may be better able to attain other things worth while. Also it must be admitted that a considerable degree of incoördination is probably a good thing. The man who was a perfectly functioning whole would never play or amuse himself, and such a person would be more at the mercy of chance than the individual of diverse interests and allegiances, for all his eggs would be in one basket. A life which is absorbed in many and different things is likely to be richer than one with a single focus.

(4) *Widening of the range of responses.* We become more versatile in handling the available resources, and greatly enlarge the boundaries of our actions and of our world. The infant responds to a relatively small number of things, and he varies his responses but little for quite different objects. In the course of development, however, interest and attention are elicited by many new objects, and specific responses more or less appropriate to each make their appearance. Place a little child before a piano, and, although he will have a delightful time thumping and whacking the keys, the poverty of the possibilities he is capable of recognizing will be apparent. He will treat the piano very much as he would treat a drum, or indeed an inverted dishpan. Adults have elaborated very different ways of using drums, dishpans, and pianos, but to the child they mean very much the same thing. This brings us, however, to the last general feature of mental development.

(5) *Development of central processes.* It will be remembered that reflex arcs consist of incoming (sensory), central, and outgoing (motor) processes, all intimately associated, and all closely related to the environment. As development proceeds, the interval between the presentation of stimulating objects and the occurrence of overt responses (that is to say, easily observable responses of the skeletal muscles)

becomes more and more significant, for into this interval are crowded a large number of central processes. Thoughts, ideas, rapid forecasts, quick developments of hopes and fears, little trial movements, and a thousand other similar processes all make their appearance, and greatly alter the nature of the ensuing overt responses.

It is highly important that this situation be properly understood, for it is just at this point that many psychologies have gone on the rocks. These central processes have no independent status outside the stream of reflexes; rather, they constitute one phase—though an indispensable phase—of that stream. On the one hand, no central processes are innervated except as parts of reflex arcs, and, on the other hand, there is no action of reflex arcs that fails to involve central processes. Or, to put the matter in anatomical terms, the spinal cord (and sometimes the brain) is involved in every stimulation of the nervous system.

Central processes are comparatively unimportant in the beginning, but as development proceeds the internal reverberations become more and more significant, until finally they enter largely into nearly all phases of action. This is not to say that conduct comes more and more to be controlled, or even to be conscious, although some measure of control and a considerable increase in consciousness do supervene, but rather that activity tends to become more complicated and involved, so far at least as central processes are concerned. By far the larger part of what goes on in the nervous system never enters directly into consciousness, but is felt there, if at all, by virtue of its effects on other processes which are themselves conscious. This is preëminently the case as respects the activity of the central portions of reflex arcs, and we should no doubt be amazed could we inspect in detail a diagram of everything that goes on inside the nervous system in connection with (say) the act of recognizing a friend as he passes on the street.⁶

Types of behavior organization

We may use the term *behavior*, in contrast to the term *reflex* (or simple reflex, since behavior responses are strictly

speaking also reflexes), to denote the developed forms of activity exhibited as responses become organized in the course of experience. In behavior the higher nervous centers of the brain are involved, action becomes more thoroughly integrated, the effects of past experience persist to alter the present situation, and purposes, desires, interests, and the like make their appearance. The past, the future, and the absent are telescoped into the present, and are no less effective than the here and now in determining what we do and think.*

An analysis of human behavior reveals three main phases, connected with the three fundamental ways in which experience is organized, and perhaps going back in the end to the three portions of the reflex arc. Behavior involves an organization and development of knowledges, uses, and enjoyments. Although to some extent a life may become specialized in one of these three directions, it should always be remembered that they are phases or aspects of essentially a single process, and that they are consequently not to be regarded as distinct in fact or even as actually completely separable in thought. They are like three views of a single stretch of country—in this instance three views of the whole man—which, taken together, disclose its characteristic features better than could any one of them alone.

(1) *The organization of knowledges.* Here organization is regarded as centering around the development of *meanings*. Although life starts with a minimum of meaning, it is not long before our experiences begin to show the rudiments of order, and notions like those of time and space are developed as pigeonholes for things. The idea of *thing* is itself an achievement, since the baby's world is more like a mosaic of all his experiences than a well ordered aggregate of sharply distinguished objects, and he must learn to tie together some

* Is it necessary to repeat that all this can go on outside of consciousness no less than within it? The question whether consciousness as such affects action seems a barren one, for three things appear to be certain: (1) processes in consciousness are effective; (2) processes outside of consciousness are also effective; (3) precisely the same process never appears in consciousness and outside it. We need rather to study the efficacy of different processes than the efficacy of consciousness, which is the collective name of a group of processes.

of his experiences at one point and others at another before he can have any acquaintance with things. A man who has been hit on the head, and is seeing stars, is probably having an experience very much like that which falls to the baby.

But we not only come to know *things*; we also become acquainted with *qualities* or attributes of things, and with *relations* between things. We call such experiences *abstractions*, largely (perhaps) because in practical life we feel that we are dealing with things, and all other experiences seem slightly unreal when compared with them. These categories to a considerable degree depend on the language-habits of our group, for they differ remarkably from one culture to another. What things we shall recognize, and how we shall distinguish them from other things, as well as how we shall relate them to other things or divide them into parts or qualities, is very largely dependent on the patterns of our culture.

Every culture exhibits a complex array of knowledge systems, developed along widely different lines and to various degrees of completeness. Each of these systems furnishes what might be called a universe of discourse, or body of facts and assumptions tied together by notions of relevancy. Thus in our culture the science of economics is one such universe of discourse; and although that knowledge system has been defined as "the science which treats of those social phenomena that are due to the wealth-getting and wealth-using activities of man,"⁷ no economist actually deals with the whole of this subject, and with nothing else, but rather with a certain body of materials that economists generally and in the main unconsciously hold to be relevant.* We are unwittingly though effectively guided by these notions of relevancy in coming to an understanding of our world, and they give a decided bent to the processes whereby knowledge systems are eventually achieved.

Aside from the several sciences, and the whole system of science, numerous other knowledge systems exist in our

* Few economists, of course, confine themselves exclusively to the conventional field of study. Most of them make private excursions into allied fields, and some even seek to extend the accepted meaning of the science.

culture, as for instance the complex body of knowledges necessary for the understanding of our arts, those data which are deemed to be pertinent to religion, that important aggregate of information which is collected under the name of "common sense," bodies of historical and of biographical statements, etc. It is by no means essential to a knowledge system that it be in accord with "the facts,"—it need only accord with the data of which it takes cognizance.

(2) *The organization of uses.* Here organization is regarded as centering around the development of the *power to act*. At the beginning the baby is affected by but few things, and the range of his responses to these is not wide, but as a result of experience the sphere of possible stimulations is enlarged and the number and variety of possible responses greatly increased. At first an infant can hardly be said to *use* anything, except in the primitive sense of directly appropriating it when it is at hand, in which sense he does clearly use his mother's breast and possibly a very few other items in his environment. As time goes on, however, the manipulation of objects increases, and they are more and more made to minister to desires and serve purposes.

While some uses to which objects are put are followed with the greatest care and attention—whether because of their novelty or on account of the complicated processes involved, or for other reasons—others are speedily turned into habits and all but drop out of mind. Thus the manner in which we manipulate table utensils seldom engages our attention, and we may be unable to give any connected account of just what we do with them. Our habits, of course, are not wholly private creations, since they are in large part required of us if we are to use the objects provided by our group in the ways that our group prescribes.

In many instances the uses to which objects are put are the chief factors in determining how the objects shall be known. This is suggested by the manner in which little children define words. A spoon may be defined as "You eat with it"; being naughty as "You get spanked"; God as "You pray to him." We never lose this tendency—and in fact we might reasonably define a thing as the sum of its

functions or uses, were it not for the fact that we naturally think of things, not only as complexes of possible uses, but also as complexes of possible enjoyments.

(3) *The organization of enjoyments.* Here organization is regarded as centering around the development of *significances*—of interests, allegiances, and appreciations. The primitive direct appropriation of the mother's breast by the infant already spoken of is apparently just as much a matter of enjoyment as of use. Be that as it may, we are continually enjoying ourselves—as we very wisely say, since enjoyment always contains a large organic element, as can be seen by placing persons of different temperamental bias in the same situation. At the same time our emotional equipment, including our temperaments, is very largely created for us by our group, and the particular things to which we are expected to react with desire, interest, apathy, aversion, or the like have been designated long before the reactions take place. Every culture pattern includes certain enjoyment systems, just as it also involves certain use systems and knowledge systems, and all developed interest and attention, except in the rarest instances, will be associated therewith. A catalogue of these enjoyment systems would have to include all the arts, and especially those arts that we call “fine,” all human pursuits that are capable of yielding pleasure or pain, the various types of social relationships, all games, sports, and recreations, as well as many other human activities.

These three phases of human behavior are worth distinguishing so that we may realize more fully some of the basic features of human action, but the distinction is highly pernicious if it leads the reader to suppose that knowing, using, or enjoying ever existed apart, or were more than three different ways of analyzing one unified experience. Sometimes one phase of the process will be more apparent and sometimes another, and it may not infrequently happen that a very considerable flow of energy can more easily be traced in terms of one of the categories than by the use of the other two, but this does not mitigate from their organic unity. A thing is not merely perceived for whatever it may in-

tellectually be worth; it is perceived in the process of use and for the sake of enjoyments. A habit is more than a way of acting; it is as well a settled way of regarding things and of feeling towards them. Belief is not only a mode of feeling or enjoying things; it is also a mode of knowledge and a mode of action. Every psychological category gains in vividness and significance when viewed from all three of these perspectives.

The distinction between knowing, using, and enjoying, appears to be a corollary of the division of the reflex arc into three parts, especially when this division is considered in relation to the distinction between the autonomic and the central nervous systems. Put briefly, using seems to be a function of the motor end of the reflex arc, and characteristically of the motor phase of the reflex arcs of the central nervous system—*i.e.*, of the skeletal muscles; enjoyment seems to be a function of the sensory end of the reflex arc, both as respects the central nervous system and the autonomic system—*i.e.*, as respects both external and visceral sensory endings; while knowing seems to be a function of the central portions of reflex arcs, and characteristically of those of the central nervous system which are located in the brain. Knowing, using, and enjoying would appear to form an acting unit because the reflex arc itself is such a functioning unit.

REFERENCES

¹ Based on C. J. Herrick, *Introduction to Neurology* (2 ed., Philadelphia, Saunders, 1918), 84-99.

² W. H. Thomson, *Brain and Personality, or The physical relations of the brain and the mind* (N. Y., Dodd, Mead, 1907), 202.

³ G. M. Stratton, *Experimental Psychology and its Bearing upon Culture* (N. Y., Macmillan, 1903), 149.

⁴ William James, *The Principles of Psychology* (N. Y., Holt, 1890), Vol. 1, 488.

⁵ William Stern, *The Psychology of Early Childhood up to the Sixth Year of Age* (3 ed., Holt, 1924), 107.

⁶ For a general description of a few of the processes involved in so simple an act as learning how to spell, see Leta S. Hollingworth, *Special Talents and Defects, Their significance for education* (N. Y., Macmillan, 1923), 99-100.

⁷ R. T. Ely, *et. al.*, *Outlines of Economics* (3 ed., N. Y., Macmillan, 1916), 4.

Chapter V

THE EARLY YEARS

In this chapter and in the one that follows we turn to a closer inspection of the events by which a baby is almost imperceptibly transformed into a mature individual. Though our present ignorance prohibits much being said about many interesting topics, it will help to a better understanding of the developed individual and his problems if we run hastily over the period of immaturity and catch a few glimpses of the man in the making. This chapter will tell the story of the early years, while the next will be devoted to an account of sexual development, which will require not only an extension of the materials already presented down through the period of puberty, but also a reinterpretation of these materials from the point of view of the place of sex in the life of the individual.

Transition periods in growth

Before beginning, the field to be covered will be mapped out, for, although life runs on without break or intermission, it does not at all times move in exactly the same directions, and some acquaintance with its transition points will clarify many things. It has always been clear that puberty is such a period of transition—the fact is signalized in many cultures by complex initiation ceremonies or “rites of passage”—but it is less commonly recognized that the years preceding puberty exhibit analogous phenomena of changes in interest and activity patterns. Green in his recent studies of the daydreams of children throws a flood of light on this subject.¹ Daydreams furnish superb materials for discovering what children are really interested in at different ages, since it is by their dream fantasies that they try to supplement the inadequacies of everyday life. Of course not all children live to any extent in a dream world, but a study of a consid-

erable number of daydreams discloses the following broad life-periods:

(1) *Babyhood* (to about the third year). In this period daydreams are either missing or are incommunicable. Life is almost entirely given over to the satisfaction of nutritional needs, and to the attainment of those early orientations of the eyes, the hands, and the language apparatus that form the essential basis of all later activity. Habits of digestion, of sleep, of manipulation, and of communication that may have to serve the individual to the end of his days are at this time formed, and the emotional patterns of most future activity laid down. The achievements of this period, as Preyer long ago pointed out, perhaps equal in mere bulk those of all the rest of life put together, and in importance easily overshadow those of any other times. Although many parents have taken pains to observe their children rather carefully during this period, it is surprising how vague and scattered our information concerning it remains.

(2) *Childhood* (from about the third to about the tenth years). In this period appears the daydream of the imaginary companion or the imaginary country. The imaginary companion fantasy indicates that the child by this time has framed the preliminary outlines of a self or ideal, so far at least as his affective or emotional life is concerned. He is now acquainted with a rôle that he would like to play, and he proceeds to play it with a person of his own creation who is so made as to conform to his requirements. Either the child himself or the imaginary companion, or each by turns, may take the leading part, for the child easily experiences the relationship from either side, as can be seen from Green's analysis of the naughty companion:²

The presence of an imaginary companion, who is "naughty," enables the child to act in desired ways, vicariously, and at the same time to assume the appearance of virtue that she imagines her parents appreciate. She is able to use their words and their gestures, to make use of the same punishments that have been employed by her parents in her own case, in dealing with the "naughty" companion. But all the "naughtiness" has to originate in her own mind: she has to plan it, and in idea

she has to execute it. In this way she "projects" her own naughtiness into the companion, and is able to carry out her wishes in an ideal form, free of all fear of punishment. In certain extreme cases, the imaginary companion is really blamed by the child for real acts that have been committed.

The imaginary companion can be of either sex, and be possessed of almost any qualities. The important thing, however, is the way the fantasy is used, and not the abstract nature of its contents. This is undoubtedly the reason why a child so often prefers a nondescript and dilapidated doll to one which is measurably realistic, and it also explains why little children are able to have as much fun with odds and ends as with the most elaborate toys. They are really playing *with themselves*.

Of course the child's self at this time is extremely rudimentary. It contains few of the social components that will later be introduced into it through the dialectic of growth. Though the child's self is primarily egoistic, it is by no means a purely personal creation, but is rather a result of the interaction of the developing organism with the complex social *milieu* in which it is imbedded, as clearly appears when specific daydreams are considered in relation to the environments which produced them. The child will learn much, as a result of further social contacts and enlarged experience with things, but the estimate he will always hold as to his powers and his worth can easily date from these early years. Even the employment of the mechanism of the imaginary companion as a means of handling an unsatisfactory situation need not disappear with the passing of the years, for it is often to be noted in adults, as in the case of the appeal to posterity. Many a man whose proposals do not now win acclaim consoles himself with the reflection that future ages will recognize the merit of his schemes.

(3) *Boyhood and girlhood* (from about the tenth to about the fourteenth years). This is the period of the daydream of the gang or the team. It usually takes the form of an adventure or escapade in which the dreamer leads his group to victory and success. The imagined activity is now socialized to this extent at least, that it involves a number of other indi-

viduals, some of whom are usually real friends of the dreamer, engaged in an enterprise involving coöperative endeavor and requiring some degree of give and take within the group. At the same time the group is usually thought of as at odds with other groups or as engaged in some essentially nonsocial (if not unsocial) undertaking. The spirit of this period is also to be noted in the more popular games, which nearly always require the choosing of sides and the pitting of one group against another. Boys during these years frequently form real gangs or clubs for purposes that they like to keep to themselves, and which, indeed, they would often find it difficult to name were they to make the attempt; while girls run in cliques and groups, have secrets, and in general exhibit the same attitudes as the boys. It will be observed that boys tend to flock with boys and girls with girls during this period, whereas throughout the greater part of childhood the sex of one's playmates is irrelevant.

In a multitude of ways the group acts upon the growing boy and girl and molds their natures as they endeavor to find a place for themselves in these rather simple associations. The different ways in which we are accustomed to treat children according to their sex is itself a case in point, for the behavior and treatment of boys and girls during this period differs far more than do their bodies. Boys are traditionally supposed to be boys and girls girls, and this helps greatly to make them different. But the influence of social considerations does not cease here. Consider, for example, the result of urban conditions on the formation of gangs;³ or the work of the Boy Scout movement in turning the gang spirit to social account; or the effects of a child's reading upon the kind of group relations he pictures as desirable; or the pervasive influence of his home life in settling what manner of person he shall be.

(4) *Adolescence* (beginning somewhere around the fourteenth year). This is the period of the romance, when the dreamer's interests again focus on a single individual, and the sex of the companion at last becomes important. Magnificent fantasies of courage and renunciation are often conjured up, floods of affectivity released, and mighty resolu-

tions formed. The specific content of the daydream need by no means be connected with sex, but the association of the thinly veiled symbolisms with the new sexual energies surging within the organism is usually apparent. The period of adolescence is fairly familiar to us as a general phenomenon, and no further description of it need be attempted here, a fuller discussion of the topic being reserved for the following chapter.

We have now provided a general conspectus of the ground to be covered, and may therefore turn to the discussion of some of the more important early achievements of development—a discussion which will be prefaced by an inventory of the infant's equipment as we find him at birth.

The baby at birth

The baby seems more highly equipped with random movements at birth than with anything else, for he moves fingers, hands, arms, trunk, legs, feet, toes, head, mouth, and eyes in a large variety of ways and in no settled order. Digestion, excretion, heartbeat, and other visceral activities are in operation, and respiration is established with the birth cry. Muscular tonus, a result of the continuous excitation of sensory nerves imbedded in the muscles, exists in good order. The infant can go to sleep and wake up, sneeze, take the mother's breast, perform the rather complicated movements of suckling, and a variety of other similar acts.⁴ All these responses, together with all others to be named in the paragraph that follows, as well as many less important activities it has not been thought worth while to catalogue, are reflexes, and in number would probably mount up into the hundreds of thousands.

On the side of sensory equipment the baby's repertoire is much narrower, for he is probably entirely deaf, so that sounds are capable of producing only shock reactions; the range and scope of his vision is extremely abbreviated, and he possesses little or no power to fixate objects; he responds to touch stimulations, though he has no power to locate his touch sensations; there is little or no integration established between the various senses; he can feel pain and *malaise*,

and seems capable of a vague vegetative state of comfort. With respect to knowledge his equipment is almost certainly *nil*.

His emotional life is also extremely circumscribed. Watson has suggested that it contains but three elements, fear, rage, and "love," which may be described as follows:⁵

Fear—caused by sudden movement of the infant or by removal of support, and by loud sounds; the response is catching of the breath, random clutching of the hands, closing of the eyes, and crying.

Rage—caused by hampering of movements; the response is stiffening of the body, slashing about of arms and legs, and holding of breath.

"Love"—caused by tickling, stroking, gentle rocking; the response is gurgling, cooing, and a general air of contentment.

Responses to pain are also native, and might well be added to this list, although psychologists are not in the habit of calling such responses emotional.

Development of eye-hand coördination ⁶

The first organ for the exploration of the environment is the mouth, into which small objects are very early conveyed. At this stage the eye and the hand function independently and only imperfectly, for until about the hundredth day the thumb usually remains folded in the palm and does not take part in the movements of the fingers, while the sphere of the infant's vision at the beginning is both narrow and shallow. A bright object must be placed within ten or twenty degrees of the line of vision of the eye, and at the right distance, or the child continues to stare vacantly out into space. Koffka asserts that an infant can fixate a bright object only after the second week; and that about a week later it is able to turn its eyes either to fixate a stationary bright object or to follow a slowly moving one. In the course of the first three months, the various head and eye movements become fairly well established, and during the next three the activities of the hand become prominent, until finally the coördination between hand and eye movements is achieved at about 120-150 days (Watson).

This achievement marks the beginning of an effective control over space. Objects seen at a distance may now be had for the reaching, or they may be requisitioned by pointing. Before then, out of sight was out of mind, and anything out of touch lay beyond the possibility of use. With the establishment of eye-hand coördination we note a great extension and unification of the field of action, to which there is no doubt joined an equal expansion and integration of the developing personality.

Learning to walk

Another advance in the establishment of space control is made when the infant begins to walk, somewhere near the end of the first year. This probably in part depends upon the maturation of the tissues involved, and in part upon the formation of habits, for infants are usually encouraged by their parents to attempt walking some time before they are able to do it. Learning to walk represents, of course, but one of the many ways in which the activities of the skeletal muscles affect the course of development.

Learning to talk

As Stern points out,⁷ three distinct processes working together lead to the development of speech in the child. There is, first, the child's meaningless babbling, for almost from the start it finds pleasure in the aimless utterance of miscellaneous sounds. This gives the laryngeal apparatus exercise, and paves the way for later efforts to enunciate specific sounds. Secondly, even before the end of the first year the child is able to understand a few requests, and it must therefore be considered to possess a certain number of meanings even before it can speak. Finally, there is the unintelligent imitation of sounds made in the presence of the child by other people. The child has started on the long road of speech-development when these three activities begin to fuse, as usually happens somewhere around the end of the first year. The process is an extremely involved one, for no language uses more than a few of the many sounds that the human being can produce, and neither his parents

nor the infant ever know precisely how these particular sounds are made.

The child's first utterances are "one-word sentences," more akin to cries than to developed speech. A wish or feeling character predominates. They are really commands or exclamations—"Mama" means some such thing as "Come here!" or "Something hurts!" There is, of course, not the slightest notion of grammar or of the categories of logic, and speech remains for some time totally uninflected.

Towards the middle or end of the second year, the child "makes the most important discovery of his life"—the discovery that everything has a name. He begins to bother his parents nearly to distraction by forever asking, "What is that?" Speech is now determined more and more by things, and less by wish or feeling states, though language never becomes completely and entirely divorced from emotion, except possibly in the upper reaches of mathematical logic. Of course things have undoubtedly been functioning as such in the child's experience before this, but a great milestone is passed when words begin to be dissociated from wish-complexes, and tied up with thing-complexes, even if the process is never carried more than a little way by any of us. It marks the initiation of some degree of objectivity into our lives.

The child's first "noes" always have the subjective significance of refusal, meaning, "No, I won't have that," whilst its significance as a statement, a negation of the objective "No, that is not so" type, is not yet existent. An eighteen-months-old child can certainly scream "No! No!" very energetically when a toy is taken from him: but if his hand is touched and he is asked "Is this your little eye?" he cannot say "No," although when asked he can quite correctly show his hand and eyes. In the case of our own children the first no as a statement appeared two or three months after the early use of the word with its affective and will tone.

The intervening time between the first and second significance of "I" is often longer. The words I, me, mine, as expressions of strong self-will, were heard from our two eldest children as early as the age of two—"I look for ball," or "Me

too" when others received anything;—but its use in mere statements did not follow until after two years and six months—as "I am small."⁸

In general it can be said that mental defectives show a closer correspondence in their speech to the earlier stages of development than do normal individuals. "The feeble-minded person is primarily conscious of his body, the outer world being but a confused background against which organic processes vividly appear."⁹

Language acts both to extend and to limit our mental operations. It extends them, on the one hand by presenting the learner with a complex set of categories by means of which he may organize his experiences, and on the other by making available through the various channels of communication an immense array of data of all degrees of validity and worth. It limits them by making it difficult for the learner to order his experiences in any other manner than that provided for him by his language, or to appreciate data that are not easily expressed in its terms. When things have received names, they are the more easily held before the mind. When they are not named, they offer no mental handle by which they may be grasped and manipulated. So important, indeed, is language in our social life that a special chapter in Part III of this book is given over to a discussion of the subject.

*Learning to count*¹⁰

Long before objects are counted they are formed into natural groups, for the absence of one of a small number of items will be noticed even when the objects cannot be distinguished. After a short period when each object in turn is named with a numeral—as "One; one; one"—the serial arrangement of objects is achieved at about the beginning of the second year—"One; one more; one more." From this point the distance is not great to "One; two; three"—but at first the numerals are employed almost as concrete position names in the succession, and only later does the last number stand for the whole series; that is to say, the use of cardinal numbers follows the use of ordinals.

For a long time after a child is actually able to use numbers he may still be unacquainted with their abstract character. Thus a little boy aged four years three months when asked by his grandfather, "How many fingers have I got?" replied, "I don't know, I can only count my own fingers." Many adults have equally inadequate notions of the abstractness of other branches of mathematics, and may believe (for example) that geometry deals with the properties of actually existing figures.

Among many peoples counting and other arithmetical processes are much less important than they are in our culture, where they are required by the nature of our economic life, as well as by the demands of our science. These cultures therefore often possess extremely abbreviated number systems, some peoples being unable to count beyond three or four. It must not be thought, however, that they are necessarily incapable of distinguishing between larger aggregates. They will know, for example, that one of their sheep is missing, not by making a count of the herd, but rather in the same way that the father of a family will miss a face at the dinner table. This implies no deficiency in natural intellectual power, but merely the absence of a certain piece of social apparatus.

Development of the power to inhibit movement

The little child is quite unsocialized, and turns all experiences naïvely towards himself. He cries when he is hurt, wriggles when he is tired, speaks out when he feels like talking, tells people when he dislikes them. The drawings of little children are illuminating from this point of view. They contain an absolute minimum of photographic fidelity, carried far beyond the inability of the child to represent the thing as it is—or, in other words, children pay almost no attention to the object they are drawing. "It never occurs to the child to look at the object he means to draw before he begins, or continuously during his sketch."¹¹ Again, when music is being played, the child almost never of his own accord sits still and listens. The music is either completely ignored, or else the child begins to sing or dance.

These facts simply illustrate the nonexistence in the child of inhibitions that are to some degree operative in nearly every adult.

But the child's world of self-centered enjoyment is immersed in the world of grown-ups, and he is continually expected to do many things, and to refrain from doing others. His uninhibited inclinations are always being curbed. He is forever being asked to make distinctions which cannot but seem to him to be arbitrary and baseless. Certain things that he would like to do he learns are bad—but "bad" to him can only mean those actions which his elders vehemently forbid him to do, and then perhaps themselves perform. Only if he somehow feels that he can trust his parents is the edge of the paradox removed, since he is hardly in a position to understand even the more sensible prohibitions, and the others are of course unintelligible without a considerable amount of training and indoctrination that can only come later.

In one way or another, however, under the requirements laid upon him by his group the child learns to inhibit his movements and focus his responses. The regular course of habit formation no doubt also leads to the same result, for it involves the interlacing of movement with movement, and this requires a considerable amount of mutual inhibition of movements. But the power of long continued concentration on thoroughly nonprimary activities exhibited by the average adult in the course both of his work and his play is essentially a social product, and begins to make its appearance even in the life of the little child. The group provides not only the social forms and the apparatus which make such concentration necessary, but also the ideals and habits of thought which make it humanly possible for men to endure it.

Development of thought

Unquestioning belief in the absolute validity of its experiences is the natural attitude of the human mind, whereas doubt has to be learned. The little child, in the absence of conflicting experience, will believe anything, and only later

does he, like the Houyhnhnms, discover that men sometimes say "the thing which is not so." Even with adults any idea tends to be believed that for any reason has coercive force.

Any relation to the mind at all, in the absence of a stronger relation, suffices to make an object real. . . . As a rule we believe as much as we can. We would believe everything if we only could.¹²

Belief is in fact the "cognitive emotion."¹³ Anatole France has put the relations between belief and doubt in adult life most mischievously in the following passage:¹⁴

That Pyrot had stolen the eighty thousand trusses of hay nobody hesitated for a moment to believe. No one doubted because the general ignorance in which everybody was concerning the affair did not allow of doubt, for doubt is a thing that demands motives. People do not doubt without reasons in the same way that people believe without reasons. The thing was not doubted because it was repeated everywhere, and, with the public, to repeat is to prove. It was not doubted because people wished to believe Pyrot guilty and one believes what one wishes to believe. Finally, it was not doubted because the faculty of doubt is rare amongst men; very few minds carry in themselves its germs and these are not developed without cultivation. Doubt is singular, exquisite, philosophic, immoral, transcendent, monstrous, full of malignity, injurious to persons and to property, contrary to the good order of governments, and to the prosperity of empires, fatal to humanity, destructive of the gods, held in horror by heaven and earth.

Little children, then, are absolute dogmatists. Being devoid of experience, their conviction is complete. What they want they feel they should have, and what they think they feel should be so. At about the age of three, however, problematic words like *perhaps* and *maybe* enter the child's vocabulary, and he begins to distinguish between his own utterances or beliefs and the facts of the case. The power to ask questions for the sake of obtaining information also argues at least a tacit recognition of some discrepancy between thought and fact. Not all questions asked by children or adults, however, have this motivation.

The first items to disentangle themselves from the general flow of experience and be separately noticed are *persons* and *things*. This has happened when the child recognizes his mother and his father, his bottle, etc. A little later the *actions* of persons and of things arrest his attention, and eventually become the objects of separate regard, and finally the child is able to deal with *relations* between things and with individual *qualities* or attributes of things. The child probably never thinks of actions, relations, or qualities in absolute independence of the things to which they pertain, nor indeed do many intelligent adults. It is the rule to deal with such phenomena by imagining a particular instance, or a large group of instances, and letting this stand for the naked item under discussion. How shall we think of *withness* or *nearness* in complete abstraction from all particulars?

The flow of experiences is thus steadily enlarged, and at the same time memory, habit, expectation, and desire assume a prominence in mental life that they never afterwards relinquish. Parallel to the organization of movements there occurs, under the guidance and control of the group, an organization and development of inner (central) processes. Not all phases of this inner life are directly and completely under social control, no more than our movements are absolutely and entirely so controlled, for individual or biological factors are also of effect, but the group influence is both deep and wide. It is to be found at work even in our dreams, since their content is largely determined by the success standards, taboos, personal estimates, and plans of action of those about us. In this respect, at any rate, the contents of our dreams in no wise differ from the thoughts of our waking life.

Development of the affective life

In discussing this topic we shall be compelled to retrace, though from a slightly different point of view, some of the ground covered in previous sections, since feeling, acting, and thinking are inextricably intertwined in human conduct. We shall discuss in turn the increase in the range of emotional response, the formation of sentiments and of "com-

plexes," and attention, desire, volition, and thought considered as phases of the life of feeling.

(1) *Increase in the range of emotional response.* Watson's work and the investigations of Mary Cover Jones have shown that the child starts with a very narrow complement of emotional reactions, and that these reactions are elicited by comparatively few stimuli.¹⁵ In particular the children studied showed no unlearned fear of the dark or of animals. All such fears, as well as by far the greater number of the emotions exhibited by adults, are apparently either learned or are the products of maturation. The evidence strongly indicates that the former process is by far the more important. The learning takes place by the mechanism of the *conditioned reflex*, through which existing emotional responses to potent stimuli are transferred to previously neutral objects. Loud noises have a shock effect upon the organism, and it has been shown that a child can be made to fear an animal by presenting the animal a number of times simultaneously with this stimulus. The child shrinks from the sound, but the response becomes associated with the total situation rather than with its specific cause, and soon the animal by itself is capable of producing the fear reaction.

Plenty of evidence is available in support of the view that our early emotional experiences are extremely important in determining how we shall approach the situations of later life. It is both cruel and dangerous to submit little children to horrible or terrifying experiences. The effects may persist to mar the child's future long after the event has been forgotten.

(2) *Sentiments.*¹⁶ Not only is the range of emotional response greatly widened, until we react with feeling to many objects which would once have left us cold, and until many fine shades of interest and concern are developed with respect to the diverse objects of this world. New complications and aggregations of feeling also make their appearance, and maintain their unity over varying periods of time. Sentiments are such relatively enduring emotion-clusters, focusing upon or radiating from some particular object, or group

of objects. Home—what various and mingled feelings are suggested by the word! Love of—any one of a thousand things, from Mary Jane to God, from marbles to philosophy; hatred of yet another thousand things; friendship; sportsmanship; patriotism—all these are sentiments, for they are complex emotion systems centering about an object. Consider love: ¹⁷

There are several aspects under which we may think of love. Physical in its origin, in first resort it is a passion of the body. At the same time it is the most powerful of spiritual and intellectual tonics; like wine it percolates through the body to the springs of thought and emotion, and becomes a stimulus to wit, imagination, feeling, courage, endurance, sympathy, self-sacrifice, and all the activities of man. Again, looked at in a different light, it is the strongest of social bonds, the basis of the family. Again, it is the most intimate of human associations, a union for "mutual society, help and comfort." . . . There is a conception of love in which it becomes unearthly, supernatural, the exclusive food of the soul, the ambrosia which only immortals taste; it is no longer grown in the soil, or ground in the mills of earth. Once it was a bond in which man was on a level with any animal; now its physical origins are so far forgotten that it becomes a symbol of the union of Christ with His Church. Once it was vain and frustrated without the satisfaction of desire; now the rejected lover feels that he reaps the fruit of his passion as fully as his successful rival.

It goes without saying that we seldom regard our sentiments very objectively. The loves of other people may cause us to smile, and we sometimes catch them smiling at ours; we may even recognize it as a bare fact that our sentiments are only rational when it serves them to be; but we continue to yield them our allegiance just the same. And why shouldn't we? Sentiments are heavily coated with the feeling of value, and what after all is more valuable than values? * Our beliefs and our rationalities are sentiments too; and, as Warren points out,¹⁸ so is our feeling towards the

* A friend who was criticizing this passage remarked, "This is terrible. But after all, sentiments deserve only a sentimental defense."

real—it sometimes disappears in pathological cases. It is one of the conditions of the good life that we hold fast to that which we hold dear. It is easier to reform and refine sentiments where they exist, than it is to revive the power to feel their pulls when it has once died away.

(3) *Complexes*. Students of psychology have become familiar with this term as a result of the work and writings of the psychoanalysts, and especially of Sigmund Freud. It is pointed out that a peculiar psychological condition results when some strong human craving, usually if not always sexual in nature, is denied its fundamental and direct satisfaction, either because it runs against deep-seated human repulsions or because it conflicts with solidly established social taboos. The illicit craving is seldom allowed to appear in its own proper nature in consciousness, although it affects action and veiled representations of it make their appearance in thought.

Thus it is claimed that many boys develop sexual attachments for their mothers, as a natural result of the intimacy of their relations during infancy, but, since the barest suggestion that these feelings exist would be unendurable, they never become explicitly known, though their effects are registered in one or another type of compensation. This, for example, is said to be the reason why a boy may be jealous of, or even somewhat antagonistic towards, his father. He unconsciously regards him as a rival for the affection of his mother. This too, aside from the chance workings of mere propinquity, is the chief reason why most of us marry as we do. We fancy that we have freely chosen our love, and upon merit alone, but actually we noted in someone we met a darling trait of our mother, and through this person our repressed sexual love for our parent gains overt expression. Again, the sexually frigid person is said to be one in whom these illicit desires are so strong, or have been so thoroughly repressed, that the ability to transfer the love for the parent to another person has been destroyed.

The above analysis is given to make clear by a specific example how the term complex is employed by psychoanalysts, and without assertion that the facts are in all respects

exactly as there represented. That mental life exhibits such things as complexes—*i.e.*, strong urges or cravings which, being denied direct expression, effect a reorganization of the emotional and active life so as to secure symbolic, vicarious, or indirect expression—is beyond question, as likewise that most (though probably not all) such complexes do center around sexual problems. So little is known about these matters, however, and psychoanalytic theory is couched in terms of such a peculiar and unbiological psychology (and one which offers so much scope for the undisciplined use of the imagination in framing explanations), that nearly the whole of the psychoanalytic *theory* may well be unsound. At the same time the fact remains that Freud has opened up for study a vast and important aspect of human nature, almost entirely ignored until he illuminated it with his vivid analyses, and that he and his followers in many instances have alleviated or removed profound mental disturbances.*

There can be no reasonable doubt that the motives we recognize and assert to be governing our conduct often differ from those which are actually effective in determining it. We are seldom in a position to see that this is the case in any concrete instance, though we sometimes catch a glimmer of the fact, especially in moments when we strongly doubt, or are strongly assured of, the rightness of what we are doing. A good rule to follow would be to look with special suspicion on any course of action which recommends itself as obviously and clearly rational. No one who has lived on close terms with other people and has kept his eyes open need be at a

* It would seem as though psychoanalytic *theory* were irrelevant to the analytic *process*. The analytic process involves the sympathetic and thorough-going examination of all available psychological materials, including the dreams, slips of the tongue, chance reactions, associations of ideas, likes and dislikes, everyday activities, etc., of the patient. Now if the patient is actually disturbed about something, and *rapprochement* with the analyst has been established, the cause of the disturbance will necessarily be referred to many times over in the course of a series of interviews, and the analyst is bound to become intimately acquainted with the patient's life—more so even than the patient himself, since he stands outside it in a different feeling-system and with a fund of previous experiences to help him. This will be the case whatever the theory upon which the analysis is conducted, so that the doctor should often be able to help his patient even if his theoretical interpretations of the data furnished by the analytic process are faulty.

loss for examples of complexes. People who take the trouble to explain everything they do are often trying to convince themselves as well as others that they are acting wisely. In one person a dogmatic manner of utterance serves to conceal and protect a shyness which almost amounts to fear; another hides his timidity behind a forced gusto and triviality; a third for the same reason erects a high wall of reserve and impersonality about his person; while shyness drives yet a fourth to bookish ways he secretly detests.

(4) *Attention.* Certain stimuli intrinsically possess coercive power over the infant's sensory apparatus, so that all movements are focussed upon them when they present themselves. After the development of the capacity to move and accommodate the eyes, for example, a bright light presented off to one side will cause the infant to turn his head and fixate it. We then say that he is attending to the light, or (to express the same thing in terms of feeling) we say that movements take place so as to secure the maximum of affect (*i.e.*, of feeling satisfaction). The truth of the last statement cannot be demonstrated in the case of the infant, but in adult experience we know that feelings do cluster about the object attended to. When a man is closely watching a football game, the distraction offered by even slight interruption is highly disagreeable and even painful.

Attention is always expectant—it looks forward. Even in the simplest instances it is anticipatory, although it would be going beyond the evidence to say that from the beginning we attend to things *in order* to see what will occur. This eventually does happen, and finally we arrive at the point of attending to things so that we can direct and control them as we wish. This development establishes the connection of attention with action no less than with feeling.

Attention introduces order into our experiences. It is a focussing of movements, a regarding of things from a certain point of view or in a certain perspective. When we are in a noisy crowd we sometimes overhear scraps of conversation, but these garbled sounds and incomplete utterances remain meaningless until attention shifts to them. They then get put into contexts and yield sense; but the moment the center

of concern drifts elsewhere we again hear only a confused babel of sounds. Attention, however, is not a thing but a process—the process whereby experiences become ordered about one or another phase of our affective life.

(5) *Desire*. Every reflex arc under stimulation is the carrier of its own particular impulse. It possesses, that is to say, a drive or momentum of its own while it is being stimulated, and the energy thus released can leave the arc only by activating muscles or glands or by entering other arcs. Thus there is established a never ending cycle of sensori-motor activity which draws the whole organism into its orbit and binds it intimately to the surrounding environment. The natural outcome of stimulation, therefore, on the one side is action and on the other is the production of the whole gamut of organic changes, that is to say, every reflex in operation leads both to internal and to external changes—to changes in the organism and to changes in the world. The internal changes come about largely through the stimulation of the visceral segments of reflex arcs, the external changes through the activation of the skeletal musculature. Impulse in the beginning is a mere “Let this be done” affair, having no object and no end in view, and possibly even no identifiable feeling quality of its own. But every impulse nevertheless does push in a certain direction, and does to a certain extent stir up other organic activities. If the fuss created by any impulse be great enough, the whole organism will be thrown into acute disequilibrium; and if the overt actions accompanying such a stirred-up state for any reason fail to restore the organism to order and quiet, new adjustments will be made. Among the more important of these adjustments are the phenomena called desire, purpose, thought, and will.

Desire arises in the first instance when impulses of sufficient organic importance are prohibited from functioning. Every impulse pushes on towards its satisfaction, for human beings are always moving, as Hobbes once said, *towards* or *fromwards*. These movements in the beginning are probably purely objective occurrences, and many of them remain just that and nothing more all through our lives. If the proc-

esses of digestion work perfectly we need never know, from our own experience, that we have stomachs. But the man who does not know from bitter experience that he has a stomach is a rarity, and no man is so fortunately placed as never to have been hindered in any of his movements. In the face of hindrances feeling surges up, and in the heat of frustration desire is born, for it is then for the first time that something is *wanted*. Desire is our name for this feeling of lack. Needs exist before desires are born, since the organism is not self-sufficient in its activity at any time and requires materials from the outside to keep it functioning. Nor do we desire whenever there is a lack, but only when this lack actually becomes conscious—the consciousness of the lack being itself the desire.

Desire therefore is rather the result than the initiator of movement. As Spiller has put it,¹⁹

Normally an act is just an act and no more. It requires no footmen to usher it in, and no host to utter words of welcome. Being an expression of a need, it is its own explanation and justification.

The time may come, of course, when men will be able to explain their actions, but that explanation will probably be couched in the terms of physiological chemistry or of biology rather than of psychology.

(6) *Volition*. When impulses are frustrated, we commonly do something about it, and this action against resistance is called willing or volition. No will is involved in the simple eliciting of a reflex response, such as raising the arm to ward off a blow, but will makes its appearance when such actions are hindered. Since hindrances to the functioning of impulses may be either external or internal, will is exercised both against other persons or things and against ourselves. The issue is usually made a personal one, even when mere things do the hindering, and the battle rages between me and you, or me and that thing, or between two claimants for selfhood within me. Every self is a compound of habits and volitions, the habits looking backwards to the past and what was, the volitions looking forwards to the future and

what will be. The "I" of every one of us is largely a volition—it always includes much that we really are not, but would like to be. A refined and developed will is always largely a social product.²⁰ We are taught what parts of our activities to call really ourselves, and we are encouraged to develop these impulses at the expense of others. In this manner all the members of a group will tend to develop personalities which display the same general contours.

The conditions of modern civilization require from us rather unusual degrees of regularity and permanence in many activities which seem better adapted to intermittent use. This is the case, for example, with work, and especially with mental work. The human system seems capable either of intense exertion over a short period of time or of a rather low degree of exertion over long periods of time. But under social pressures, a high degree of exertion may be exacted over long periods of time, and habits of restlessness and constant activity may even be developed, in opposition to basic human needs. In such circumstances our desires become unhealthy, and the development of a sound self is difficult and sometimes impossible. And it is just at such a time, also, that self-will becomes especially prominent. Well-rounded selfhood disappears, and its place is taken by the cult of the self.

(7) *Thought*. The life of thought will be considered at some length in a later chapter, when an attempt will be made to state in detail what goes on when men think. Here, therefore, it need only be remarked that both the subject-matter of thought and the occasion or need for thinking nearly always arise outside the thought process itself. Thinking is called upon to play a part in a game which it did not devise, with implements not of its own construction, and for reasons which it must in the end take for granted. It is in the life of the feelings that one must search for an explanation of thinking.

REFERENCES

¹ George H. Green, *The Daydream, A Study in development* (Univ. of London Press, 1923).

² Green, 79.

³ For a bibliography of gangs, see R. E. Park and E. W. Burgess, *Introduction to the Science of Sociology* (2 ed., Univ. of Chicago Press, 1924), 657.

⁴ For fuller details, see J. B. Watson, *Behaviorism* (N. Y., People's Institute Publ. Co., 1925), 90-99.

⁵ J. B. Watson, *Psychology from the Standpoint of a Behaviorist* (2 ed., Phila., Lippincott, 1924), 219-221.

⁶ Cf. Watson, *Psychology*, etc., 265-266, 296-302; William Stern, *The Psychology of Early Childhood up to the Sixth Year of Age* (3 ed., N. Y., Holt, 1924), 81; Kurt Koffka, *The Growth of the Mind, An introduction to child psychology* (N. Y., Harcourt, Brace, 1924), 74.

⁷ Stern, 142.

⁸ Stern, 376. The grammar of this citation has been slightly clarified.

⁹ Knight Dunlap, *The Elements of Scientific Psychology* (St. Louis, Mosby, 1922), 358.

¹⁰ Stern, 377f (the story about the little boy and his fingers is on p. 382); Koffka 334-335.

¹¹ Stern, 353.

¹² William James, The psychology of belief, *Mind*, Vol. 14 (1889), 334-335.

¹³ Charles Waldstein, *The Balance of Emotion and Intellect* (London, 1878), 7.

¹⁴ Anatole France, *Penguin Island* (London, Lane, 1909), 204-205.

¹⁵ See reference 5 above; also Mary Cover Jones, The elimination of children's fears, *Journ. of Exper. Psych.*, Vol. 7 (1924), 382-390.

¹⁶ See A. F. Shand, *The Foundations of Character, Being a study of the tendencies of the emotions and sentiments* (2 ed., London, Macmillan, 1920).

¹⁷ R. W. Livingstone, *The Greek Genius and Its Meaning to Us* (Oxford, Clarendon Press, 1912), 78.

¹⁸ H. C. Warren, *Human Psychology* (Boston, Houghton Mifflin, 1919), 303-304.

¹⁹ Gustav Spiller, *The Mind of Man, A textbook of psychology* (London, Sonnenschieden, 1902), 302.

²⁰ Graham Wallas, *Our Social Heritage* (New Haven, Yale Univ. Press, 1921), 25.

Chapter VI

ADOLESCENCE AND MATURITY

The importance of sex

Our culture offers no paradox more puzzling than its attitude towards sex. Here is a tremendous human force, the direct or indirect theme of most of the world's greatest literature, the subject matter of a large proportion of the daily thoughts and feelings of the average man, the strongest urge to human activity, a scorching flame which is capable of revealing a man's nature from top to bottom, the very well-spring of life—and over this great focus of human energies is spread an almost impenetrable blanket of silence, innuendo, and ignorance. With all the talk and thought that hovers about sex, little of really primary significance has as yet been uttered and mankind seems determined, if possible, always to flirt with this most interesting and dangerous of all subjects. This fact alone is responsible for most of the problems raised by sex in our lives.

Suppose that eating and drinking was never spoken of openly, save in veiled or poetic language, and that no one ever ate food publicly, because it was considered immoral and immodest to reveal the mysteries of this natural function. We know what would occur. A considerable proportion of the community, more especially the more youthful members, possessed by an instinctive and legitimate curiosity, would concentrate their thoughts on the subject. They would have so many problems to puzzle over: How often ought I to eat? What ought I to eat? Is it wrong to eat fruit, which I like? Ought I to eat grass, which I don't like? Instinct notwithstanding, we may be quite sure that only a small minority would succeed in eating reasonably and wholesomely. The sexual secrecy of life is even more disastrous than such a nutritive secrecy would be; partly because we expend such a wealth of moral energy in directing or misdirecting it, partly because

the sexual impulse normally develops at the same time as the intellectual impulse, not in the early years of life, when wholesome instinctive habits might be formed. And there is always some ignorant and foolish friend who is prepared still further to muddle things: Eat a meal every other day! Eat twelve meals a day! Never eat fruit! Always eat grass! The advice emphatically given in sexual matters is usually not less absurd than this. When, however, the matter is fully opened, the problems of food are not indeed wholly solved, but everyone is enabled by the experience of his fellows to reach some sort of situation suited to his own case. And when the rigid secrecy is once swept away a sane and natural reticence becomes for the first time possible.¹

The primary need in connection with sex, then, is for the removal of the taboos and restrictions, not all of them external by any means, which hinder attempts to understand this subject. Human beings must learn to approach the problems of sex with the same freedom and desire to discover the truth that they often exhibit in other realms. Few things, certainly, are nearer to human happiness than an early and adequate understanding of sexual life. This need becomes crucial at puberty, but it exists before and after that period as well.

Men are sometimes loath to admit the great place of sex in life. Could anything be plainer? Even a cursory glance at human institutions and activities is enough to settle the question. In some men, of course, the fire of life burns low, or with a flickering flame, and these persons are by no means always among the most weakly endowed of our kind. But thought and activity thus removed from the close and vitalizing touch of passion is generally doomed to be esoteric, and ever tends towards sterility. As for the great mass of mankind, no one can doubt that the feelings connected with sex are the preëminent driving forces. "The main principle of enjoyment for the human race is not art, nor thought, nor the practice of virtue, but for man, woman, and for woman, man."² Love in very truth makes the world go round. An ethics or a code of life which ignores this fact condemns itself to essential triviality from the very start.

The biological significance of sex

Sex is apparently not necessary for reproduction, since many kinds of plants and animals reproduce without reliance on its mechanisms. One celled animals like the ameba, for example, simply subdivide, the parent animal thus perpetuating itself in the creatures which take its place. In the case of many animals both sexes are present in some generations, and but one in others. In fact, the arrangements whereby new organisms are brought into being are many, although it is the rule among the higher animals that a male and a female must have sexual intercourse for the production of new members of the species.

Though sex is not everywhere necessary for reproduction, and may some day be dispensed with in the case of man, it is of considerable biological importance as a guarantee of variability. Two hereditary strains are mixed in sexual reproduction wherever inbreeding—mating between closely related members of the same family group—does not occur. It has frequently been suggested that the population of isolated islands deteriorates when new blood is not available to vitalize the indigenous stocks. Barring external accident, a similar stagnation would also seem to be the fate of unsexed animals, whereas new qualities may now and then be expected to appear whenever two individuals of different heredity mate. That this possibility is of considerable social importance is indicated by the new combinations of qualities noted whenever peoples who have previously been separated begin to interbreed. The mating of peoples of different stocks is not always fortunate from the sociological point of view, however, especially when one of the groups is laboring under social prejudices and disabilities, as is the case, for example, with negroes at the present time in many parts of the white world.

The sex history of the individual

The human being undergoes great changes at puberty, for it is then that his sexual powers mature and he becomes able to reproduce his kind, but it must not be thought that sexual influences are unimportant until that time. The

precise opposite is the case. Nor are the effects of sex confined to the sexual organs; from birth to death the organism responds throughout to sexual influences. Nor, finally, are these influences at work only when sexual feelings separately and definitely arise into awareness; they are permanent features of our make-up, the effect in the first instance of a more or less regular flow of internal secretions from the appropriate glands, and eventually also of deep-set bodily trends and habits built upon this foundation.

In order to understand the full range and importance of sex in human life, then, it is necessary to divorce the discussion from an exclusive connection with reproductive processes—that is to say, not only from the desire for children, which is weak in many persons (mostly males), but also from the specific desire for physical sexual relationships. These items, in fact, form but a small part of human sexual urges. Let us trace the history of sex in the life of a human being, making use, where we can, of the factual data uncovered by the work of Freud and his associates, while refusing to become involved in the more theoretical interpretations of these data that he has offered.³

The history of a human being commences, it will be recalled, with the fertilization of a female cell or ovum by a male cell or spermatozoön. At that time the basic heredity of the new individual, including its sex, is determined in accordance with Mendelian principles, and the complex process of cell division initiated which finally results in the infant who some nine months later is born into the world. In the course of development specific germ cells are eventually formed and the individual attains the power of reproduction, but these changes by no means mark the beginning of sex life. Satisfactions of sexual significance are probably present from the very start. A number of bodily zones in the adult are always especially sensitive to at least quasi-sexual stimulation, as for instance the lips—*cf.* the sensations accompanying kissing; and it seems fairly certain that even the infant experiences rudimentary pleasures of the same sort from the kisses and caresses visited upon it, and also from the act of suckling. The sensations accom-

panying the excretion of waste products from the body also furnish another group of quasi-sexual pleasures. These experiences have been called auto-erotic, for they are pre-vaillingly self-centered, and they are at least in part connected with the developing sex life, as is shown by their manner of functioning in cases of sexual abnormality. To this aspect of human experience as it develops more completely a little later, Freud has given the name of Narcissism. Narcissus was the Greek youth in the myth who admired his own reflection in a pool of water.

It is inevitable that the child's early feelings should depend very closely on what happens inside his own body. His initial experiences can not carry him beyond the organism, although they are dependent at every moment on extra-organic factors. The earliest notion of an *other* is no doubt furnished by the mother. She flows ceaselessly in and out of the baby's widening experience, touching it where it is most vivid, in connection with feeding, excreting, cuddling, being washed, and the like. And so the internal organization which is to furnish the infant with a self, develops in terms of an external environment which centers largely around the mother. The attachment for the mother which results is certainly seldom sexual in the developed adult sense of the term, but it does contain elements which also appear in adult sexuality, and no end of case histories might be cited which show the biographical continuity of adult sexual feeling with the earlier mother fixation that has been described. The precise significance of the mother relation is more obscure in the case of girls than with boys.

In middle childhood, somewhere between the sixth and the eighth years, the earlier auto-erotic absorption in the child's own bodily processes and the later absorption in the mother normally recede into the background, and interest is awakened in other children of the same sex. Before this time most children choose their playmates indiscriminately from either sex; but it eventually comes about, speaking generally, that boys play with boys, and girls with girls, while members of the other sex are ignored or despised. This stage in sex life is less clearly established either than

those which precede it or than that which follows, the precise details differing greatly from one individual to another, depending on the size and composition of the family, the available playmates, the previous course of development of the individual's life, and other similar considerations. Social influences tending to segregate and distinguish the sexes also no doubt help to motivate the appearance of divergent interests and activities, but these social arrangements seem to be in broad accord with fundamental biological urges.

At the time of puberty new interests and energies are again released, and yet another focussing of the child's sex life is required, which (like the others) has both its internal and its external aspects. The organs of sex mature, and their secretions lead to structural and physiological changes of the first magnitude. In addition, the feeling life of the individual is greatly altered. A new set of interests in the opposite sex is developed (heterosexuality), together with a great increase in general affectivity. It is highly important that the earlier stages in sexuality should give way smoothly and easily to the heterosexual stage. Where they do not, the prevailing social demands and restrictions almost inevitably generate grave psychological disturbances. The earlier sexual interests, although they began as something very different, must at puberty be brought under the control of the impulses centering around reproduction. This is the great problem which the adolescent must solve—at the present time with practically no acquaintance on his own part with what is going on inside him, and with little or no help from the outside. The task, by no means a simple one under ideal conditions, must for the present be attempted under distinctly adverse circumstances.

The net result is that persons living a thoroughly sound and healthy sex life are probably less common than those whose sex life suffers from maladjustments. It will not be necessary to enlarge upon the perversions that may occur. They range all the way from sexual frigidity to extreme incontinence; from the most nauseating desire to inflict pain (sadism) to the opposite desire to have pain inflicted upon

one's self (masochism), based upon sexual malfunctionings; from minor personal aberrations to the most complete subversions of the whole personality; and from very slight deviations from the accepted sex practices to the grossest misconducts. Many people suffer from a morbid interest in such themes—an interest which is itself no doubt in large measure generated by the prevailing taboos and ignorances.

The need for sex education

Time and again one is brought back to the great need for organized sex training and education. It is silly to ask whether children should have any ideas at all on the subject of sex, since few children grow up without receiving some form of sex education from one source or another. The important question relates to the kind of education that shall be offered them. The child must understand what he sees and feels in some manner, and where a sane and healthy interpretation is lacking one of another kind is often pressed into service. Children are interested in these matters. They speculate concerning them, and compare notes or seek information from irresponsible sources. It is a rare child who has not wondered where he came from, and how, and why his body is made as it is.

Most important of all, the normal and largely inescapable outlets of sexual energy in the infant and young child are not such as naturally to adapt him to the situations he must face as an adult. They turn him towards his own body, towards his parents, or towards members of his own sex for stimulation. The child's sexual attitudes might properly be called naturally perverse, for in the circumstances of the case they are directed towards illicit objects. Later on, with the approach of puberty, the ripening of new powers and interests introduces puzzling features into the adolescent's experience. The basic life relations of childhood start to crumble and to disappear, and the previously stable world begins to take on new colors and to rearrange itself into novel perspectives. It becomes all too plain to the adolescent that his life is being made over; but how, and to what effect? That he usually does not know. It is important that the

energies tied up with his former ways of living be made available for the new situations and responsibilities of adulthood. Some form of planned preparation for this crisis and this opportunity is highly necessary.

A great many people are ashamed of their bodies, and feel that the ideal would be to ignore sex entirely. No policy could be more foolhardy or dangerous. Some few adults by strenuous effort might be able without undue loss to ignore even so potent a phenomenon as sex, but no normally endowed child could. Children are in urgent need of training and education regarding their sexual life. And moral maxims are not enough, for on this subject especially they are bound to lack content if they are not supported by a knowledge of their meaning and application. What does it avail a child in this connection to be told that he must remain pure in heart? His heart is not impure; he is merely ignorant, an adult in the making, and sexual habits and restraints of a reasonable nature have not yet been formed—nor can they easily be, without help from others.

What should be taught ⁴

Under the four headings that follow an attempt is made to indicate very briefly the main elements in a feasible program of sex education. It is extremely desirable that the major part of some such program covered fairly early in every child's life—considerably prior, that is to say, to adolescence—under natural auspices, as in response to the child's questions, and preferably in the home. The order in which the topics are presented has nothing whatever to do with the order of instruction, nor with the manner in which the instruction itself should be conducted. The end in view is the inculcation of a natural and sane attitude towards sex as a feature of human life, and not the indoctrination of the child with an abstract and useless body of data.

(1) *Personal hygiene.* Training in personal cleanliness and in the care of the body, including the organs of sex and excretion. The formation of proper eating habits. The development of a healthy, active, all around life, with

varied social contacts. There is no more valuable prophylactic against sexual trouble, for in a life with many interests sex becomes but one competitor among many for time and energy, and little opportunity is given for the development of morbid fixations.

(2) *Physiological and biological knowledge.* How men and women differ physically from each other. The general facts as to birth and reproduction. The facts as to nocturnal emissions, menstruation, and other normal phenomena of the sex organs. The general principles of heredity.

Veiled speculation on physiological topics can only be prurient when carried on by children in the face of contemporary taboos, and nothing they could know would surpass what can be imagined. Adolescents are caused a vast amount of unnecessary alarm by the normal phenomena of sexual life, and in many instances they are induced to frame notions of sex and sexual relations that definitely stand in the way of their future happiness.

(3) *Sex training.* This training is undoubtedly of much greater importance than any amount of knowledge, although of course, it is not a substitute for knowledge. It would involve the formation of wholesome and open attitudes and habits:

Towards sex—that it may seem a natural and cleanly function, as simple and obvious a part of the order of nature as breathing. The number of people, and especially women, who regard sex as nasty is amazing, and this feeling in itself is responsible for much human unhappiness.

Towards one's self—that the young person may respect his powers and possibilities, and not misuse them.

Towards one's parents—that there may be no undue dependence and no morbid jealousies and frictions. This places a large responsibility on the mother, since she must insist on releasing her child from his bondage to her, so that it may be possible for him to face the world as a free individual.

Towards persons of the other sex—that comradely relations may be possible, and that marriage may be regarded as a normal feature of human life. This is not to say that much improvement in existing social arrangements regarding sexual relations may not be necessary before the situation can be

looked upon as satisfactory, but rather that marriages should be conceived as made neither in Heaven nor in Hell but on earth.

(4) *Sex knowledge proper.* This knowledge would be concerned with what might be called the psychology and sociology of sex, so that the young person might see its general place and importance in the economy of things, its possibilities for human good, and its intimate connection with happiness.

Were young people to receive such a training and education in matters of sex as has been outlined, it would be too much to expect that everyday life would be completely made over and that all sexual aberrations would disappear. Many difficulties are intrinsic to the situation, and would remain untouched by any effort, but in this respect the problems of sex do not differ from those to be met with in other fields. A vast amount of unnecessary obstruction to healthy development would at any rate be removed, and the way would be cleared for more healthy relationships between human beings.

Nonconscious factors in life

Within the last twenty-five years the work and theories of Sigmund Freud have given birth to a school of psychologists and medical practitioners who strongly emphasize the controlling part played by unconscious factors, principally centering around the sex life, in determining life interests and activities. Freud himself began this work by following leads laid down by still earlier investigators, among whom were certain French psychiatrists. A new field for study was thereby opened up, and it is now evident, quite apart from any peculiarities of the Freudian interpretation, that our lives to a great extent are built upon factors with which we never really come to grips. In this section an effort will be made to name a few of these factors.

Our lives, when we come to think of it, are a queer mixture of the clear and the obscure. We naturally emphasize the clarities, not only because, being clear, they appear more

significant, but also because we can see what they are like and to some extent can control them, or at any rate know why and how we failed in the attempt. And yet from time to time we have experiences which make us wonder if most of the clarities of life are not on the surface. We fall in love and can give no rational explanation of our predicament; we are subject to the most unaccountable fluctuations of mood and temperament; or we note with amazement that the things for which we have striven with all our might turn to dust and ashes in our hands at the very moment of victory. It is natural in such circumstances to wonder if the clear parts of life tell the whole story.

Beyond question they do not. Nor do these clarities reflect more than a small part of the forces that make us what we are. Awareness is perhaps our most precious possession, as it is certainly the most mysterious feature in our lives. It adds immeasurably to the interest and value of experience, but after all it is of extremely limited significance when we try to understand what we really are. Consciousness is like a tiny pencil of light which plays dimly over the surface of a nearly opaque body into which it penetrates but a very short distance. Most of the constituents of experience never once come within the area of illumination; others are shone on only now and then; while a few are almost continuously illuminated. But even the particles which are almost continuously illuminated are affected and sustained by yet other particles on which the light never once shines.*

The picture sketched in the preceding sentences in no way exaggerates the actual situation. Life starts from unconsciousness or extremely diffuse consciousness, and in large measure returns to another unconsciousness—that of habit. The origins and bases of thought and activity alike in almost all instances are beyond our ken; as we experience them they are often surprisingly spontaneous and unreasoned. We are not differently situated as respects the deep-seated temperamental attitudes with which we face the world, for

* Of course the image is faulty in the end. Consciousness is not a light shining down from the outside onto our lives. It is itself a part of our natures, one—though only one—of the many synthetic activities whose sum and totality we are.

our general bodily sets and tendencies are formed we know not how. Perhaps they are partly conscious reverberations of the massive visceral organs, combined with the subtler feeling tones which the muscles are continually contributing to the ensemble, and embellished by our feeble attempts at consistency and continuity of policy. Or, to consider another great body of nonconscious mental materials, the past, of course, is dead and done for, but is nevertheless somehow or other still capable of functioning in the present. What happens to knowledge when it is not actually in the process of being known? Our minds are certainly not like attics in which relics of the past are stored, to grow dusty until they are pulled out, from time to time, to be put to some temporary use. Even forgotten things, and things of which we are totally ignorant, are dynamically influential in determining the course of our thought and action.

A large part of every mental content is memory the source of which is forgotten. Just as our vocabulary is memory, though we do not remember how and where it was acquired, so our judgments, beliefs and opinions are in large part made up of past experiences which are forgotten but which have left their traces as integral parts of concepts ingrained in our personalities.⁵ *

The future as we imagine it also somehow functions in experience, although it is not easy to conceive the precise source and status of these prognostications. The very contents of our dreams are revelatory of yet other mental materials lying in regions untouched by normal conscious life. We regularly receive vague intimations, also, of the subliminal stimulation of the nervous system—*i.e.*, of stimulations too weak to yield conscious experiences, but strong enough nevertheless to result in the excitation of reflex pathways. Finally, purely physical factors (as, for instance, air pressure) are continually acting on our lives, without our ever being satisfactorily aware of their influence.

But, it may be asked, if these factors are nonconscious,

* Morton Prince, *The Unconscious*, 85-86. Copyright, 1921, by The Macmillan Company. Reprinted by permission.

how is it that we know of their existence? The knowledge is gained in a number of ways. Some items are so altered between successive appearances in the stream of conscious life that we are forced to conclude that they have somehow been acted on outside of consciousness. Thus I go to bed with a problem unsolved, and wake in the morning with the answer in my head. Again, it is possible in many instances to show that items on the edge of consciousness, as it were, are effective in determining the total feeling of the situation. Although it cannot be said that they are noticed, their absence would be noticed, for the total situation would then become vaguely different. Once more, we frequently see people who are affected by forces of whose existence they are totally oblivious, and we ourselves feel at times a narrowing or an expansion of the area of awareness. Through special techniques, such as hypnosis and automatic writing, it also becomes certain that more is going on in us than we commonly suspect. A person in a hypnotic trance will reveal sensory powers, or will give evidence of knowledge, that his waking self would never dream he possessed. Studies conducted by Freud into the mechanism of slips of the tongue are also pertinent in this connection, since they often reveal the existence of subliminal mental processes. Freud regards these slips as repressed desires securing illicit conscious expression, and it can hardly be doubted that he shows in many instances that they are not entirely unmotivated.⁶ Finally, the study of pathological cases permits us to catch glimpses of phases of human activity not ordinarily revealed in average human beings, although it must be admitted that students of human nature have to date made very little use of the abundance of material illustrating and explaining normal human processes to be found in the study of pathological specimens. Abnormal individuals are, as Ribot pointed out, often excellent magnifying glasses and instruments of analysis for the better understanding of normal processes.

Watson has recently suggested that the nonconscious elements of experience are those which by their nature are un verbalized, either because of their early occurrence, or

because they are primarily visceral, or for other reasons. They have never succeeded in influencing our language habits, and have consequently never become an explicit part of our thought life.⁷ This no doubt accounts for many of these elements, but hardly for all, since some of them do get turned into language, as in delirium, slips of the tongue, etc.

Were these nonconscious elements of a man's life to be abstracted from the totality which constitutes his life, the flow of conscious experiences would no doubt be rendered meager, thin, and unendurable. Consciousness is continually being fed and invigorated from the outside. The non-conscious experiences we have discussed enter into and structuralize a man's very self of selves. In determining its nature they are many times more important than what he wittingly does and says. Together with the steady pressures of the social environment, they keep him from changing with every breeze and tempest which ruffles the surface of his life, and give him whatever stability and momentum his existence may have.

REFERENCES

¹ Havelock Ellis, *Studies in the Psychology of Sex*, Vol. 1 (3 ed., Phila., Davis, 1913), iv-v.

² Edwin Muir, in Freda Kirchwey (ed.), *Our Changing Morality* (N. Y., Boni and Liveright, 1924), 79-80.

³ See Sigmund Freud, *A General Introduction to Psychoanalysis*, (N. Y., Boni and Liveright, 1920), for a general presentation of the Freudian point of view. See also Ernest Jones, Some problems of adolescence, *Brit. Journ. of Psych.*, Vol. 13 (1922-1923), 31-47.

⁴ On this matter I have been helped by Isabel Davenport, *Salvaging of American Girlhood, A substitution of normal psychology for superstition and mysticism in the education of girls* (N. Y., Dutton, 1924), a book written mainly with the problems confronting adolescent girls in mind, but applicable to boys as well (see esp. Chapter 12). See also M. J. Exner, The sex factor in character training, *Amer. Phys. Educ. Rev.*, Vol. 30, (1925), 71-76.

⁵ Morton Prince, *The Unconscious* (2 ed., N. Y. Macmillan, 1921), 85-86.

⁶ Sigmund Freud, *The Psychopathology of Everyday Life* (N. Y., Macmillan, 1917).

⁷ J. B. Watson, *Behaviorism* (N. Y., People's Institute Publ. Co., 1925), 130-131, 208.

Chapter VII

THE ORGANIZATION OF THE INTELLECTUAL LIFE

Organic features of the thought process

Human beings are always more or less stirred by what they do and by what happens to them. The stimulation of reflex arcs often leads with remarkable directness to an appropriate response. Thus the iris of the eye contracts when one passes from a darkened room into the bright sunlight, in much the same fashion as the aperture of a camera lens might be adjusted under similar conditions. Even here, however, the pain feeling which frequently accompanies the adjustment is evidence that the impulses released do not travel down a single deeply canalized path, but rather flood a considerable number of loosely associated reflex arcs. Many stimuli are capable of throwing the entire organism into a state of extreme disequilibrium, and of initiating organic reverberations that continue for long periods of time, while there are few if any stimuli so weak or so concentrated in their effects as not to lead to some degree of reflex overflow. A certain diffuseness of response serves to distinguish organisms from machines. This is not to say that organic activity is in any respect loose or haphazard, but only that organisms are extremely sensitive instruments when compared to the stimuli that ordinarily play upon them. Like delicate and well-built violins, the slightest touch starts complex vibrations throughout the whole structure.

Analysis has distinguished two chief types of organic reverberation, called respectively feeling and thinking. The chief center though by no means the only source of the reverberations called feelings is the viscera, since feelings are largely the result of stimulation of the autonomic nervous system; while the chief center though by no means the only source of the reverberations called thoughts is the brain,

since thoughts are largely the result of stimulation of the central portions of the central nervous system. In an earlier part of this book it has already been pointed out, and in connection with the description of thinking that follows it will be clear, that thought, feeling, and action never occur in isolation, but so many false notions respecting thought are abroad that it has seemed best to devote a chapter to an analysis of our intellectual life.

Three prominent features of human experience seem sufficient for the description of what goes on when men think:

(1) *The stream of experiences.* Something is always happening to an organism. It is itself continuously active and it is as continuously being acted upon by its environment. An organism might well be defined as a moving pattern of relations between a protoplasmic complex and its environment; it is strictly of the essence of an organism to act and be acted upon.¹ An organism is *never* inactive; the flow of adjustment and counteradjustment continues during sleep, when we are unconscious, and even for some little time after death, since all parts of the body do not cease functioning at the same moment. Only a few items in the stream of experiences ever enter in their own right into consciousness, and become explicitly known to us, though many others are summed up, as it were, in the prevailing feeling tone of the organism at any given moment. These two things—the stream of experiences and the data of consciousness—need to be distinguished, though the two realms are intimately connected. The former includes the latter and much more. At the present moment, for example, I am acutely aware of a certain idea that I wish to express, and various suggestions pop into mind. Some of these suggestions seem relevant, while others are immediately disposed of as being beside the point. This happens quickly and easily, because I am not working merely in terms of what is clearly before me in consciousness, but can also depend on a considerable fund of accumulated experience that need never distinctly enter the field of awareness. This experience can only exist within the organism in the form of continuously activated

reflex arcs. The mind contains no filing cabinet into which inert data are dropped until such time as they are needed. And, as we shall see, the suggestions that pop into mind—and it is such suggestions that we call thoughts—do not spring up irresponsibly into awareness, but are really *pushed* into consciousness, as it were, by the pressure of affective states.

(2) *The pressure of affective states.* There is something peremptory and insistent about a feeling; it elicits interest and concern. Few if any items in the stream of experiences provoke absolutely no reverberations of feeling, and appear before us in such total neutrality as to awaken no shade of preference towards or against. Items in the stream whose feeling tone is high are always moving towards the center of attention,* where they displace other items whose affective content is lower. To a certain point the vigor with which adjustments are made depends on the strength of the feelings involved, but the emotional excitement may at times become so strong as to throw the organism into confusion and destroy the possibility of adjustment.

(3) *"Recession of the stimulus."* This is Holt's phrase² for the fact that, as development proceeds, more and more time usually intervenes between the first indication that action is necessary and the moment when action must commence if it is to be effective. In the beginning responses either follow hard upon their stimuli or, in cases where some time does elapse between the initiation of an activity and the moment when action becomes irrevocable, we are not acquainted with the fact, and can therefore do nothing. Many life processes, however, are more or less recurrent, and in various ways we are apprised that action will shortly be necessary some time before we actually need to act. Except possibly in a very few exceptional instances, we do not consciously delay our responses in order to think; the delay in the necessity of overtly reacting to the stimulus is made possible by the recession of the stimulus.

Suppose I am playing tennis, and have just returned the ball to my opponent in such a way that I am at his mercy.

* Or attention is always shifting to these items—for it little matters which way the relation is expressed.

He can pass me either on my right or my left. Which will he try? If I have not made myself familiar with his play, I can only wait until he has made his stroke, and then lunge wildly for the ball. But perhaps he has certain habits, of glance, of footwork, of racket-swing, or whatnot, which would betray his plan, did I but know them, and which would enable me to shift my position *before* his stroke has actually been made. I should then be responding to his intention before he had really carried it out, thanks to the recession of the stimulus for that particular stroke.

In a creature with an active and insistent flow of mental processes the recession of the stimulus means everything in making thought possible. Among the reasons for this increase in the time interval between the first indication of the stimulus and the necessity for a final response may be named the following:

- (a) The effects of past experiences throw light on the present situation. Thus we may remember how we handled a similar situation, and with what result; or habit may save time by speeding up our responses; or we may have learned that events occur in a certain order, and from the occurrence of the first be warned of the imminence of the second; etc.
- (b) The existence of distance receptors. We soon learn to recognize objects while they are still some distance away, and before it is necessary to respond directly to them. It is a good thing that not all of our senses require immediate contact with the objects perceived, as does touch, for we are thereby given time to prepare our response.
- (c) The formation of purposes which cannot at once be realized, but which nevertheless are brought to bear on action. Purposes involve the formation of plans—of imagined responses to imagined situations, which are held in readiness for use when the situations actually put in their appearance.
- (d) The existence of a body of tools, techniques, and knowledge, and the fact of communication. Through these means we receive advance information as to what may happen, and suggestions for dealing with problems before they arise.

The stream of experiences furnishes the materials, the existence of affective states the drive, and the recession of the stimulus the opportunity, for thinking.

Analytical description of the thought process

It is now possible to state more clearly what takes place when men think. Thought occurs when, for reasons connected with our affective life, some item in the stream of experiences awakens interest or concern, and there is sufficient time for the resulting disturbances to work themselves out before an overt response is necessary.* Consider the following simple instance of thinking: The question arises (no matter how), "What shall I do during the coming vacation?" This is a question which concerns me, and so it elicits attention. So long as attention is focussed on the problem the flow of experiences is altered, and a variety of memories and possibilities keep coming to mind, each with its own feeling tone. These items play upon and affect each other, but, since I need not answer the question just now, whereas other matters are pressing (*i.e.*, have a greater present feeling value), the center of attention soon shifts to them. The vacation problem returns in one form or another from time to time however, until finally a satisfactory answer comes to mind, or until temporal limitations make an arbitrary conclusion of the process necessary.

The following stages can be distinguished in every thought process: †

(1) Eliciting of attention by some item in the stream of experiences, by virtue of the feeling quality pertaining to this item—*i.e.*, muscular adjustments orient the body with respect to a stimulus of high feeling tone.

(2) Resultant changes in the stream of experiences. Items already present in the stream are redistributed or driven

* By an overt response is meant one involving the skeletal muscles.

† In the analysis that follows an attempt is made to describe the basic psychological features of *all* thinking, and not merely of a special type of thought. For a logical analysis of reflective thinking (*i.e.*, thinking in the eulogistic sense of the term), the reader is referred to Dewey's treatise entitled "How We Think" (Boston, Heath, 1910). Reflective thinking is also briefly discussed in a later section of this chapter.

out, and new items connected in one way or another with the item on which attention is focussed make their appearance. These changes involve further disequibrations and affective disturbances, and are accompanied by new movements toward adjustment.

(3) Resolution of this conflict or disequibration through the emergence of some unifying item, around which feeling (and therefore attention) now centers.

(4) Action or expression flowing from these changes. These last two steps almost invariably constitute the first and second stages of a new thought process.

Thought continually moves back and forth between "data" and "ways of looking at data." Anything is a datum in a given situation that is there taken for granted, either because it is accepted without question or because it offers resistance to being swept aside or ignored. Whenever we think, something is at least temporarily thus taken as a datum (*i.e.*, is attended to), and the process of thinking in every case is one of finding some quality or attribute which when ascribed to this given (datum) will alleviate an affective disturbance. For example, the queer scraping noise I just heard became the datum for a thought process when it distracted me from my work. It was a noise, all right—I didn't question that—but just *what kind* of a noise was it? Was it a rat running about between the walls; or the breeze rustling my papers; or did I after all merely imagine it? Thought is a scurrying back and forth between givens and ways of interpreting or handling them.

Now, as has already been indicated, the thought process is motivated throughout by affective considerations. Our emotional life determines not only (1) what things are taken as data (*i.e.*, what things elicit attention), but also (2) what suggestions for their interpretation or handling shall arise, and (3) how these suggestions shall be received. The three items just named roughly correspond to the first three steps in the analysis of thinking. The fourth step merely indicates that the matter is not closed with the development of certain attitudes, but that thinking always has consequences in action.

When "ways of looking at data" are regarded from the point of view of the thought process itself (that is, logically), they are often called *meanings*. A meaning, in any situation, is a certain way of regarding something else which is there taken for granted. "Chair," for example, is a meaning when it indicates a kind of thing to be sat upon; that is, "chair" is one way of regarding a certain wooden structure. "Furniture," "fire-wood," "antique," "heirloom," "bad bargain," are other ways of regarding this same structure, and therefore other possible meanings. Meanings in every case are expressions of attitudes, and as our attitudes change from one moment to the next so also do our meanings change. What appears as a datum and is taken for granted in one experience may therefore figure as a meaning in another, and *vice versa*. When chairs, for example, become the subject matter of an investigation (as they are for a collector of old furniture), they figure as data or givens, and meanings are developed about them as a center.

There are, then, two inseparable movements in any complete thought process: from data to meanings, and from meanings to data—that is, from givens to a conclusion, and from this conclusion on to new givens. The former movement is called *induction*, and the latter *deduction*. Things are first seen in certain light (induction), and by being thus perceived new qualities are ascribed to them (deduction). The direction of movement in the second stage of the analysis of thinking is inductive, since it proceeds from a given towards its meaning; while the direction of movement in the fourth stage is deductive, since it proceeds from a meaning towards the attainment of new givens.*

* The situation, however, is a little more complicated than this; for if three thought processes, *a*, *b*, and *c*, develop in the order named, the second stage of process *b* will be the fourth stage of *a*, and its movement will then be deductive as respects *a*, and inductive as respects *b*. Similarly, the fourth stage of *b* will be the second stage of *c*, and its movement will be deductive as respects *b* and inductive as respects *c*. In other words, whether a thought process is deductive or inductive depends on its place in an act of thought, and not on its intrinsic nature. These terms are *functional* terms rather than terms of *status*. If you know only that I am counting the number of peas in a large number of pods, you cannot tell whether I am doing it as a means of reaching a theory (induction), or as a means of testing or proving a theory I already hold (deduction).

From the above it follows that the progress of thinking is very closely dependent on objective considerations. This is true of aimless daydreams no less than of severely ordered processes of thought. All thinking goes on in the same world—and that world is the one in which we live and move and have our being. The mind is not an independent thing which dwells in state in a private realm of its own—it is merely our name for a certain organization of human activity, separable only in analysis from other human activities and from the world which is the *locus* of all our experiences. The materials, the techniques, and the ideals of thought are all drawn from this world, and the consequences of thought, be they a furrowed brow or a headache or a new social system, must also find a place in it. It is also apparent that thinking is properly speaking an act of the whole man. The *man* thinks, and not merely the brain or the mind. Some part of the affective complex (the sum of likes and dislikes, of leanings towards and fromwards) upon the basis of which thought occurs will always be contributed by obscure and humble parts of the body. A man whose finger has just been crushed is not quite able to follow the train of thought that was in process before the accident. New feelings have entered the situation to alter the relationships that previously obtained. Every thinker is soon brought face to face with the ebb and flow of his thought in correspondence with his general bodily condition.

Again, a variety of thought processes will nearly always be in operation at the same time, and will interact, affecting and displacing each other. The claimants to attention are usually many, and some are so impetuous as to demand a hearing before their predecessors are ready to yield the floor. Only in very exceptional cases does a thought process work itself clear through to a conclusion without being helped or hindered by subsidiary or competing processes.

Two kinds of thinking

Two somewhat different kinds of thinking may now be distinguished—aimless or autistic thinking and purposive thinking. The first is primarily a case of “thinking about,”

the second of "thinking out." In autistic thinking the affective attitudes motivating the process are comparatively vague and indefinite. They are perhaps never really aimless, but are rather determined by mood or temperament—that is, by the more deepset and permanent feeling tones and affective habits of the organism. Good examples of autistic thinking are to be found in our daydreams—or take the mood indicated in the following poem by Emily Dickinson:

To make a prairie it takes a clover and one bee,—
One clover, and a bee,
And revery.
The revery alone will do
If bees are few.

Another name for this type of thinking is *imagination*. Fancies, wishes, observations, conclusions, scraps of every kind, are almost continually "passing through our heads," and life would indeed be a drab affair were it not for this casual functioning of thought processes.

In the case of purposive thinking, the thought processes are under the control of some definite purpose, or set of purposes, which determine the conditions under which the thinking goes on. Some end is to be attained, and the problem is one of making such use of the available resources as will most satisfactorily realize the end in view. This end may be of any kind whatever, and of any degree of importance. We often spend a long time thinking about trivial matters, and no time at all in deciding questions of real moment. In general, however, we think most, though not necessarily most effectively, about the things that concern us most; no situation, in any event, has the power of compelling thought apart from the feelings it arouses. For it to occasion thought, a situation must not merely *be*—it must *be significant*; and whether it shall be significant depends on the appeal it makes to the feelings. Psychologists usually write as though emotion were invariably disruptive of thought, but Stratton has shown, with respect to the major emotions (as fear and anger), that the primary effect, after

the initial shock and except in extreme cases is "like a further awakening of a mind already awake," in that the tempo of experience is more rapid, there is a lowering of the threshold for ideas, integrations of ideas are more easily accomplished and there ensues a period of heightened responsiveness or apprehension.³

Although autistic and purposive thinking can be distinguished, and do occasionally occur in comparative isolation, it is generally advisable to regard them as opposed tendencies at work in a single process, rather than as entirely distinct phenomena. Almost any live and significant thought process makes use of materials gained through both aimless and purposive thinking. Either process without the other tends to be sterile, as can be seen by a reference to the way discoveries are made. More often than not they seem merely to happen. To all appearances they are entirely spontaneous and unpremeditated; without warning and without previous announcement the problem is solved, and the man who turned the trick is no better able than anyone else to explain how it happened. But it is worth noticing that few discoveries are made by unprepared minds. The discoverer must have been after something; he must have been expectant or eager or ready; there must have been previous study or thought in the field in which the discovery was made; in many cases the chief function of a discovery in the life of the discoverer is the satisfaction of a gnawing lack. A great emptiness in his psychic processes is relieved by the new item. This is no doubt the source of the fierce exultation that so often accompanies discovery.

Consider the account which Richard Strauss, the composer, gives of the creative process: ⁴

I also have material for two symphonic poems, but don't know which one I shall use—if indeed I shall finish any—now. It usually takes two years before a composition begins to assume form with me. At first there comes to me an idea—a theme. This rests with me for months; I think of other things and busy myself with everything but it; but the idea is fermenting of its own accord. Sometimes I bring it to mind, or play the theme on the piano, just to see how it has progressed

—and finally it is ready for use. You see, therein lies the real art of creation—to know exactly when an idea is ripe, when one can use, must use it. More and more I cling to the belief that we conscious people have no control over our creative power. For instance, I slave over a melody and encounter an obstacle which I cannot surmount, however I try. This during the course of an evening; but the next morning the difficulty has surrendered itself, just as though my creative forces had toiled at it over night. Several years ago I told a friend that I meant to compose a symphonic poem, *Spring*. He repeated my remark, and at the making up of the next music festival programme my *Spring* was placed on it and I was asked to conduct it! The work is not even composed yet, despite the great number of themes and sketches I have for it. In fact, I don't know when I will compose it—if at all. Sometimes a theme occurs first to me, and I find the poetic mate to it later; but at others the poetic idea begins to take on musical form.

Let no reader conclude that this description of discovery is pertinent enough to the arts, but that it is inapplicable to the more sober and pedestrian sciences. It applies to practically all thought processes, in all fields where thinking goes on. Few of our thought processes from any field—even business!—are so prosaic as not to be affected to a considerable extent by the results of aimless thinking. The English physicist Tyndall, in his *Essays on the Use and Limit of the Imagination in Science* very aptly states the relations between aimless and purposive thinking in science. He says: ⁵

Knowledge once gained casts faint light beyond its own immediate boundaries. . . . The force of intellectual penetration into this penumbral region which surrounds actual knowledge is not, as some seem to think, dependent on method, but upon the genius of the investigator. There is, however, no genius so gifted as not to need control and verification. . . . The brightest flashes in the world of thought are incomplete until they have been proved to have their counterpart in the world of fact. Thus the vocation of the true experimentalist may be defined as the continued exercise of spiritual insight, and its incessant correction and realization.

The arts and the sciences cannot be distinguished from each other on the ground that the arts depend on the imagination, whereas the sciences have no use for that function. The great scientist is just as imaginative as the great poet, and the great poet is just as tied down to the facts—*his* facts—as the great scientist. Each is imaginative about different things and in a different manner, somewhat as poets (or scientists) differ among themselves in this same respect, but each according to his personal idiosyncrasy exhibits a fund of imaginative power. Similarly, each conforms to the logical requirements of his own vocation—and these demands are quite as severe in poetry as in science. Nothing could be more tightly logical and integrated within the terms of feeling than a great poem. We are too prone to compare the ordinary garden variety of scientist with the unusual or great poet, and to conclude that the differences we note depend on their respective vocations. Lack of imaginative vigor is an attribute of the prosaic man, whether he is to be found among the scientists or the poets. “Mathematics is every bit as much an imaginative art as a logical science. . . . If you wish to know the answer to a question, you must first ask it, and the art of mathematics is the art of asking the right questions.” The postulates of a mathematical system contain the conclusions in the same sense that a piano contains a sonata.⁶

It is of the essence of aimless thinking that it be uncontrolled, and all attempts to direct it usually have the effect of warping or suppressing its possibilities. Its products, however, need be no more evanescent and elusive than the products of the most practical thought, and can therefore be made the subject matter of further purposive thinking. In this manner the results of aimless thinking can be refined and criticized in the cold light of day. It is also true that purposive thinking can often be carried on to great effect in the electrified and freshened atmosphere left after a fruitful period of aimless thinking. The phrase “disciplined imagination” as applied to thinking is somewhat unfortunate; it leaves the impression of imagination leaping about and performing tricks at the bidding of some master—a

master who will probably be labelled REASON in large letters. Imagination does not work that way. She is a bird of the open woods who sings her sweet song when and where she will. Caught and put in a cage, she may still twitter now and then, but her voice loses its unfettered charm and she becomes like any common bird.

Whatever attractiveness and piquancy our thought life may possess will depend mainly upon our thought habits, and these seem to hark back, in the end, to the relatively stable character of our autistic thinking. Most of the peculiar little mental twists and foibles that distinguish one mind from another are offshoots and developments of our dream lives. Why should one man with engaging perverseness insist on approaching all problems through the back door? Why should another be so blunt in his thinking? Why should a third tickle and tease the thoughts out of himself and you? And why should the thoughts of a fourth come forth enveloped in foggy robes of uncertainty? Why is one man always analyzing, and another always "getting larger views"? Questions such as these mark but a few of the ways in which people differ with respect to the characteristics of their autistic thinking.

As F. L. Wells neatly put it, "Realistic thinking contributes mainly to making it possible to exist, and autistic thinking to making it worth while to live."⁷ And to a surprising extent men succeed in alienating themselves from reality in making life worth living. It is indeed curious that so much of human happiness should depend upon the unreal, the untrue, the irrelevant, and the problematical.⁸ We find it hard to believe that this is the case with ourselves, but no other conclusion is possible when we glance back at antiquated and no longer accepted schemes of thought. It requires the greatest effort, patience, research, and aptitude to see these old systems as they must have appeared to intelligent contemporaries. Students who read St. Thomas Aquinas for the first time, for example, often complain that his arguments are silly and his books dogma-ridden, but to the men of the thirteenth century his arguments were not silly and his books were daringly original.⁹

Nor are we on this account entitled to conclude that therein we have an advantage over that century, our opinions being right and theirs wrong, for in time to come, no doubt, our opinions will seem silly and our books reiterative of dogma—save that to some few men some few of our works, as likewise some few of those of all periods before us and after, will be thought worthy of being rescued from the oblivion of time; and these not for the truths they contain but for their abiding interest and power.

Sometimes it seems that truth is one of the least important of the goods that this world has to offer. And so indeed it is, often, to a man who lives in a group having sufficient control over truth to permit him, if he wishes, to spend his time dreaming. He need not think sober, practical thoughts, for his neighbors will think soberly for him. Such persons, however, are incomplete human beings, even when they are not thoroughly incapable of taking care of themselves. Autistic thinking by itself is but a fragment; it is contributory, not complete. But so is purposive or practical thinking, since even the ends it posits as desirable can seldom be attained without the assistance of aimless thinking. Even more; life cannot be lived under the constant stress of striving to realize ends, and without a rather large amount of aimless activity and thinking. Men who try to evade this fact go a long way towards making themselves nervous wrecks.

Reflective thinking

No description has as yet been offered of “reflective thinking,” which Dewey defines as “active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it, and the further consequences to which it tends.”¹⁰ Reflective thinking attempts to be critical, orderly, circumspect, impartial, and thorough. It is typically initiated by some problem or difficulty, which presents itself for solution or resolution. It tries to take account of all the relevant facts, to criticize and evaluate all of the assumptions and explanations that suggest themselves in the light of objective considerations, to select the one that is most likely to be

applicable to the problem in hand, and, finally, to submit it to test or verification before acceptance. Reflective thinking, of course, is one form of purposive thinking; it is thinking that tries to be impartial and objective.

Reflective thinking might be called the ideal of thought. Like most ideals, it is seldom actually realized. It can figure, however, as a motivating force in experience, and in this manner affect, where it cannot control, the course of thinking. The problem has two somewhat different aspects—for we need to know how to think correctly, and we need really to desire to think that way. Of these the latter is, of course, the more important, though little can be done to change our desires beyond the skillful application of exhortation and example. It is essentially a moral matter, and one that is complicated by the fact that nearly all of us are convinced that, in the main, we do think fairly and straightforwardly. On the contrary, however, bias seems almost intrinsic to the human mind, and strong bias in favor of objectivity is about as rare as unusual artistic talent or greatness of soul. Few of us are interested in impartiality to the exclusion of everything that interferes. This is not to deny that many eminently fair conclusions are reached by every man, for many men are capable of estimating with great accuracy whether a given proposal will or will not fall in with the directions of the mind. Things are often judged shrewdly enough with reference to their practical usefulness in furthering or hindering purposes. But even here objectivity is not easily attained; and its achievement is still more difficult when conflicting purposes and aims must themselves be evaluated. It might be said that objectivity becomes difficult as it becomes important.

A thousand trifling illustrations of the rarity of unbiased judgments spring readily to mind, but we shall have to be content with the presentation of a single important example. The mind, then, has a natural bias towards the perception of order. We group things into kinds; we frame laws and principles which we think of as governing things; we are easily hypnotized by systems, whether of thought, of religion, of diet, of exercise, or of breaking the bank at Monte

Carlo; we think of our actions as being brought about by simple proclamation at the behest of clearly conceived ends; we imagine ourselves to be governed with Tsar-like autocracy by a single and unitary Mind; we reconstruct the past in simple and clearcut terms, see the present in obvious outlines, and often imagine that the future will usher in some delightful and orderly Utopia, if only something—perhaps woman suffrage or prohibition or light wines and beers or democracy or socialism or universal education or anything—can once be secured; and so on.

The irony of our bias towards order is heightened when we realize how disorderly our mental life itself actually is. What a wilderness of conflicting and competing purposes; what scraps of knowledge and opinion, of truths, half truths, and no truths; what a medley of feelings and desires; what a hodgepodge of tendencies and inertias, of habits and memories, of fancies, pictures, guesses, anticipations, assertions, denials—what a disorderly congeries of processes goes to make up a man's mind! Little wonder under such circumstances that order should appear important to human beings. To put the matter figuratively, Mind would rather reduce the whole cosmos to order than clear up its own private confusions. Thinking as a process is one of the most casual, hit-or-miss affairs in this jumbled world. It is even less concentrated and unified, for example, than motor trial and error; the way in which a cat will try to get out of a cage is usually system itself compared to the jumpings-about even in highly controlled thinking. It is fortunate indeed that the value of thinking in most instances does not depend on its esthetic contours or its orderliness, but on its eventual *applicability* to a particular purpose. The best minds are not always the quickest or the most orderly or the subtlest or the most thorough or the most versatile, but those which somehow get the point and turn the trick. Accordingly, it has been suggested that we perceive order because of its usefulness:¹¹

However abundant chaos or complexity may be it is of no use and nobody will trouble to notice its presence. However

scarce order or simplicity may be it will be sought for until it is found. . . . The extreme difficulty and labor of finding laws of nature . . . suggest that there is not so much simplicity and order about as people think.

For good or for ill, then, a bias towards the perception of order dominates our lives.

There is but one road of possible escape from our natural biases, and that road is open only to those who really desire to think effectively, and even to such persons only if they have the natural aptitude for such thought, and even then as a rule only after long and persistent effort. In other words learning to think is not a mere school subject, but a task for a lifetime. The task, however, can be simply stated—we must learn to know the possibilities and limitations of thought in general and of our own thinking in particular. If we can come to know and appreciate the natural biases of the mind, means can often be devised to offset them. They can be allowed for; one can be played off against another; we can call upon outside aids from other people or from instruments; etc. Hence the importance of thinking about thinking; hence the importance of method—assuming always that the desire to think straight and true is really present.

Attributes of good thinking

A person might succeed in avoiding all of the fallacies, and still not be very successful as a thinker. He would make no mistakes in his thinking, but nobody would care, because the quality of his intellectual operations was so poor. How shall a person know, after all, when his thoughts are worth thinking? Although it must be admitted that the best thinking is probably in most instances hardly conscious of its own existence, and that too great an effort to think well can easily do more harm than good, an effort to list some of the desiderata of thought may not be out of place. Among the qualities, then, that go to make up good thinking are the following:

(1) *Clarity*. Good thinking should not be obscure. It

may be difficult and hard to follow, either because of the abstruseness of the subject matter or from the ignorance or dullness of those who try to understand it, but it should not be dark in its own right. Good thinking will often be subtle, acute, penetrating; it may exact patience and effort from those who seek to comprehend it; but it should in the end be intelligible. It is not necessary to be vague in writing of vagueness.

Clarity is not synonymous with simplicity, for good thinking is often winding and even sinuous. There is a distinct pleasure in chasing a long argument over hill and dale, or in following the tortuous curves of a spider-fine web of dialectic. Nor is clarity identical with superficiality. Many people are clear for lack of something intricate to say, but we would rather listen to the maunderings of a wise man than to the precise utterances of a fool. Perhaps, then, clarity is more a convenience than a necessity of good thinking—a grace rather than the *sine qua non* of the intellectual life. An ultimate obscurity seems to cling by nature to much of the highest thought. From a dark and impenetrable center there emerge, from time to time, great flashes of light which illuminate all else, leaving only the place whence they came shrouded in night. So it is with the greatest thinkers—with a Plato, a Spinoza, or a Kant; but perhaps the rest of us had best try to be clear.

(2) *Consistency*. Good thinking does not contradict itself; it tells a story and sticks to it. This is the sum and substance of modern mathematical logic. The mathematician of today develops a set of postulates—these are his story; and then he tries to stick to them through thick and thin—that is, he traces their implications or consequences in various directions, hoping that something interesting will turn up. Consistency is thus a somewhat arbitrary matter, since it has to do only with the internal relations of thought to thought within a universe of discourse, but it does keep thought close knit and aware of its obligations to other thought. It must not be confused with stubbornness. It is not a mark of good thinking to refuse to give up a notion when it has lost its pertinence. It

was against such bullheadedness that Emerson inveighed when he said that "Consistency is the hobgoblin of little minds."

The science or art of attaining consistency is known as formal logic, but it is in mathematics that the aspiration for concatenated thought has been allowed to run wild. And, curiously enough, it is mathematics, the most abstract of all mental disciplines, that has given man the largest measure of control over physical nature.

(3) This leads us to the third criterion of good thinking—*agreement with the facts*. Every thought is about something—it has some subject matter; and good thinking does not do violence to its subject matter. Whether it be about prunes or prisms or politics, it remains pertinent to its subject and commits no irrelevancies. Since good thinking is possible in any field, the standard of agreement with the facts will differ according to the subject. This is only another way of saying that a know-nothing can hardly be a good thinker. Though large stores of knowledge are not a guarantee of good thinking, thought suffers when it is ignorant of the facts.

Just what "the facts" are in a given instance it is sometimes extremely difficult or even impossible to say. What, for example, were the facts during the years when the Copernican or heliocentric system was displacing the Ptolemaic or geocentric system? The facts remained the same during all that time, and are the same today, but what they are, entirely divorced from any theory or speculation about them, it would be most difficult to say. What are the facts about birth control? the Eighteenth Amendment? the League of Nations? the morality of the youth of today (or any other day)? We may all think we know, but we all know differently. The criterion of agreement with the facts, however, is a sound one, even if it does serve to emphasize once more the difficulties of really good thinking.

(4) *Significance*. A man who always thought clearly, consistently, and accurately would still lack something of being a good thinker if his mind never dealt in anything but commonplaces. No one would ever be able to question his

utterances, but no one would ever be inclined to do so, for his thinking would never escape triviality. It has been said that the mistakes of a wise man are more valuable than the truths of a fool, for where the wise man errs, he is likely to err significantly; his very stumblings help other men to keep their footing. Good thinking, then, is consequential; in itself it is significant, and it also involves or leads to other things that are significant.

Good thinking, in other words, is never sterile. Let it not be supposed, however, that it need be portentous, or fraught with all solemnity and seriousness. It may merely help to create an evanescent and transitory pleasure—a pleasure which may even be connected with thinking itself. Nor need it be useful in the narrow, bread-and-butter meaning of that word. Always in some way something flows from satisfactory thinking which justifies its existence; it is not entirely gratuitous and uncalled for in the scheme of life-satisfactions. It need not be novel or “constructive,” for it may merely indicate how to remove some slight hindrance to thought or action, point the way to some minor gratification, or carry in its own unfolding a modest pleasure of its own. Of course, everything good or bad has consequences, but some consequences are inconsequential, while others are of consequence. When thought is good, it falls into the latter class.

The possibilities and limitations of thought

Thinking has its times and its seasons like all other functions, and it would perhaps be safer to tell a man never to think at all than to tell him never to fail to think. Of course no human being would ever be able to follow either of these counsels, since thinking is an inevitable though recurrent human activity. The old lady was right who said that she was thinking about something or other nearly all the time; but there must have been occasions in her life when she would have preferred to “jest set” rather than to “set and think.” It is common to read praises of thinking, since most books are written by people who pride themselves on being intellectuals, but such works usually commend “good” thinking—surely an eminently praiseworthy

article—rather than the ordinary cognitive operations of everyday life.

Thought does have its values, however, in spite of the looseness with which it has been lauded. It is an important, though not the only, source of knowledge. Much that we know was first impressed upon us by the naked and insistent impact of natural objects on the organism, by the vigor and reiteration of our contacts with obstinate and unyielding things, but thinking greatly broadens the horizon of our lives by revealing the connections and significances of things and of ideas. Thinking helps us to combine the isolated items of experience into systems, and this not seldom leads to the uncovering of not previously realized connections between the materials at hand.

It is by thought, also, that we are enabled to understand and control the future and the absent. Francis Bacon has made it a commonplace that knowledge is power, and, as we have seen, much knowledge is gained as a result of thinking. Understanding and control are by no means identical, for it is possible for men to understand the fury of the elements before which they bow in helpless submission, but men rightly place merit in knowing why they must meet their doom. Spinoza in the fifth book of his *Ethics* very beautifully shows how the clear and distinct knowledge of the necessity of all things—a knowledge to be reached only through highly complex operations of thought—may minister to perfect joy and peace.

Perhaps the chief function of thinking, however, is to convince us that our actions and feelings are rational. Few human beings are satisfied merely to act or to feel; they must have reasons for everything they do. This process of finding reasons for doing something that you are going to do anyway is called *rationalization*, and a good part of all thinking is given over to the task of erecting logical barriers for the defense of the ego against internal and external attack. Thinking itself no doubt affords some people great pleasure, quite apart from any of its effects in the way of knowledge, consolation, control, or the feeling of rationality, but in most of us the impulse to think is not strong enough

to be very effective in action without the coöperation of other feelings, by which thought is used somewhat as one might employ a tool to accomplish an end. And perhaps this is well, for thought appears to lack appreciative vision except as it is warmed and supported by other feelings more strongly motivated by the needs and possibilities of human beings.

REFERENCES

¹ Cf. C. M. Childs, *Physiological Foundations of Behavior* (N. Y., Holt, 1924), esp. 10-11.

² E. B. Holt, *The Freudian Wish and Its Place in Ethics* (N. Y., Holt, 1915)—see index under title "stimulus, Recession of"; cf. L. L. Thurstone, *The Nature of Intelligence* (N. Y., Harcourt, Brace, 1924).

³ G. M. Stratton, An experience during danger and the wider functions of emotion; in *Problems of Personality; Studies presented to Dr. Morton Prince, pioneer in American psychopathology* (N. Y., Harcourt, Brace, 1925).

⁴ Quoted in J. G. Hunecker, *Overtones, A book of temperaments* (N. Y., Scribner, 1904), 33-34.

⁵ John Tyndall, *Essays on the Use and Limit of the Imagination in Science* (2 ed., London, 1870), 54.

⁶ Norbert Wiener, On the nature of mathematical thinking, *Australasian Journ. of Psych. and Philos.*, Vol. 1 (1923), 269.

⁷ F. L. Wells, *Mental Adjustments* (N. Y., Appleton, 1917).

⁸ On this point the dramas of L. Pirandello are especially interesting. See also H. Vaihinger, *The Philosophy of "As if," A system of the theoretical, practical, and religious fictions of mankind*, trans. by C. K. Ogden (N. Y. Harcourt, Brace, 1924).

⁹ See A. E. Taylor, *St. Thomas Aquinas as a Philosopher* (Oxford, Blackwell, 1924).

¹⁰ John Dewey, *How We Think* (Boston, Heath, 1910), 6.

¹¹ A. D. Ritchie, *Scientific Method, An inquiry into the character and validity of natural laws* (N. Y., Harcourt, Brace, 1923), 200-201.

Chapter VIII

PERSONALITY AND CHARACTER

Meaning of the term "personality"

In an earlier chapter a summary inventory of the baby's equipment at birth was presented, and the whole range of his powers was rapidly surveyed. In this chapter, the repertoire of traits exhibited by the developed individual will be similarly catalogued, attention being directed primarily to the various ways in which men are found to differ from each other. Personality is not a mysterious something over and above the total reactive life of the individual. It includes, of course, much more than goes on within the narrow field of consciousness, and it is but inadequately indicated by a mere listing of separate traits, since the complex inter-functioning of traits gives much of the detail determining personal idiosyncrasy, but it is not necessary to look outside of experience for an understanding of what we are. Nor does personality reveal itself in experience as an unmitigated unity, but rather as an aggregate of loosely associated unities and disunities held together by virtue of the fact that they pertain to a single organic structure. Taken largely, a man *is* all of the things that happen in and to a certain organism.*

Individual differences

The important fact of individual differences may be summed up in the statement that the members of a species always vary among themselves with respect to the exact degree to which they possess individual traits, as likewise with respect to the precise manner in which these traits are associated to constitute the total individual. Individuals differ from each other because the determiners (environmen-

* This is true even of the not infrequently reported instances of "multiple personality," in which a certain number of fairly distinct unities are actually noted within a single body, for these "personalities" are dependent on each other in a manner different from the dependence of one organism on another.¹

tal and hereditary) of any given trait are always both numerous and small, so that the probability of any particular number of them being present in a given instance is in accord with the laws of chance. Suppose, for example, that a man's height were determined by the coöperation of twenty elements, each of equal importance, and that the probability of any single element being present were just as great as the probability of it being absent. In that event, it is clear that on the average ten of the elements would be present and ten absent, while the probability of any other assigned number being present in a given instance could be calculated according to the law which states the frequency with which a given number of heads will appear when twenty coins are tossed into the air. The situation with respect to height, and many other traits, is apparently not unlike the situation we imagined, except that the number of distinct elements involved is many times twenty, and that the different elements need not necessarily be of exactly the same importance.

The following features, then, will characterize practically all instances where individual differences are found to occur:

(1) These differences will nearly always cluster around a type or mode, and large variations from the mode will be less common than small, becoming rarer and rarer as the size of the variations increases. The largest deviations, whether of excess or of defect of the quality, will therefore be extremely uncommon. Statisticians have devised a number of measures for summarizing the known numerical facts about such distributions. Thus one may report: the total number of cases measured, with the measurement for each; the range, or numerical difference between the lowest record and the highest for the group; the average or central tendency of the group (calculated in several different ways); the degree of scatter or deviation from the average; and sometimes also the skewness, or degree to which the data depart from such a chance distribution as one would obtain by tossing pennies (this distribution being taken as typical or normal).

(2) Variations are usually continuous; that is to say, if

all the individuals in a large group were arranged in order with respect to the degree of presence of a given trait, there would seldom if ever be any "missing links" between one person and the next. We might always reasonably ask, for example, whether *M* should really precede or follow *N*. From this it follows that any line dividing neighboring cases into groups is somewhat arbitrary. There will nearly always be border line cases to consider. Thus under any reasonable definition, some persons in the total population are indubitably insane, and others are just as clearly sane, but with respect to yet other persons (and there will be others) the matter is not so clear. This goes further than the mere statement that some persons may be considered insane from one point of view (*e.g.*, they are irresponsible and incapable of administering their personal property) and sane from another (*e.g.*, they are not dangerous). This is true enough, but in addition, no matter what criterion of insanity we may select, we must finally decide just what degree of that quality shall be called insanity, and that decision will partake of the arbitrary. We are all to some degree irresponsible and dangerous, but we are not all called insane; and in the end it becomes a matter of judgment where the line shall be drawn. Statistical analyses are not substitutes for judgment, though they may make the grounds for judgment clearer and more precise.

(3) Two differently selected groups will seldom contain precisely the same distribution of individual measurements, though it usually happens that the measurements for the two groups will overlap, the range of measurements within either group being greater than the difference between the averages of the groups. For example, if a group of Japanese were compared to a group of Americans with respect to height, (*a*) the two distributions would overlap, since some Japanese would be taller than some Americans, although most Japanese are shorter, and in addition (*b*) the difference between the shortest Japanese and the tallest (or between the shortest American and the tallest) would be greater than the difference between the average Japanese and the average American. With respect to but very few

if any Americans could one say that they were taller than any Japanese, and many Japanese would be as tall as the average American.

(4) If two or more qualities exhibited by the different members of a group are measured (as, for instance, the height and weight of college freshmen), it will nearly always be found that the qualities in question to some degree depend on each other. As the one varies in amount, the other varies also.

Statisticians have devised a measure (called the *coefficient of correlation*—denoted by r) of the degree to which given qualities coexist in the different members of a group. This measure varies in value between $+1$ and -1 ; it is $+1$ when the relationship is complete and positive, so that for every occurrence of a specific amount of the first quality in a given individual there is a corresponding occurrence of the second quality in that individual; it is -1 when for every instance of the first quality there is a corresponding *opposite* instance of the second; and it is 0 when there is no correspondence whatever between the two qualities, so that knowing any value of the first quality would be of no help whatever in estimating the corresponding value of the second. The coefficient of correlation does not necessarily indicate dynamic causal relations; it is merely a concise numerical summary of presence-and-absence of two qualities in the different members of a group. In general there appears to be a positive relationship between most socially desirable traits, so that a person who is heavily endowed with one such trait is likely also to possess at least a fair measure of the others.

Many of the variations between individuals are socially insignificant, while others are of the first importance. Thus if the average intelligence of a group is not high, many of its members may be unable to understand the problems that come before the group; if, however, the range of talents of this imaginary group is also wide, leaders may be developed whose abilities may go far toward making good the deficiencies of the masses. If most of the large deviations from the central tendency with respect to a desirable trait are

in the direction of deficiency, whereas the deviations towards excess though numerous are small, social problems of tremendous magnitude may be perennially generated, and that too among a population by nature little fitted to cope with them. Speaking generally, the individuals who are conspicuous as regards excess or defect of a trait will usually be foci of stress, adaptation, and change in the group.

Training usually lessens to some extent the average amounts by which people differ from each other, but, since a slight increase in the higher ranges of capacity is often of much greater social significance than even a considerable gain in the more mediocre ranges, training for the better endowed may open up entirely new possibilities, and almost invariably has the effect of separating people socially to an even greater extent than they were before training began. These differences of status are usually fairly permanent, both because they become a part of the social order and because after prolonged habituation powers are rather highly stabilized.

The study of individual differences is still in its earliest stages, and at the present time we are not even in possession of defensible scales by which to measure and interpret most traits. In addition many people, including some statisticians, are of the opinion that the use of statistics in itself is an admission that we have no control over the phenomena we are investigating. For example, the eminent English statistician, G. Udny Yule, writes as follows: ²

Statistical methods are only necessary in so far as experiment fails to attain its ideal, the ideal of only permitting one causal circumstance to vary at a time. . . . Statistical methods are not only ancillary; they are, to the experimenter, a warning of failure.

This modesty is in commendable contrast to the unfortunate overpraising of the statistical method one sometimes hears, but there does not seem to be any more reason for regretting the use of statistics than for deploring the use of the calculus or of test tubes and Bunsen burners in the course of investigations in natural science. In each instance a natural instru-

ment is employed, and there is nothing inherently unsatisfactory in this. And experiment never, not even in the natural sciences, under any circumstances can be carried to the point where but one causal circumstance is varied at a time.

Descriptive survey of personality traits

Though enough is not known to permit of a really scientific discussion of personality in all of its phases, recent studies have opened up different parts of the field, and the results already obtained are of considerable importance in the better understanding of human nature. The various aspects of personality will be discussed under the following headings, which have been somewhat arbitrarily chosen:

Physique.

Motility.

Emotionality.

Intellectual equipment.

Attitudes towards self.

Social attitudes.

Throughout all that follows there must be assumed the impress of *style* or *manner*—of those nuances of difference that when all is said and done, really make the man. Further, it should be remembered that no list of separate traits, however complete, can do more than suggest the manner in which traits actually interfunction in the living individual.³

(1) *Physique*—*bodily structure* (peculiarities of skeleton, musculature, fatty deposits, viscera, nervous system, etc.); rate and extent of *developmental processes*; *physiological functioning* (metabolism, functioning of lungs, heart, stomach, intestines, sex organs, etc.); *personal appearance* (features, hair, teeth, build, posture, etc.); etc.

An intelligent physician can learn a great deal about a man's personality through a thorough examination of his physique. Quite apart from any necessarily conscious operations, the structure of our body is effective in determining what manner of person we shall be. Alfred Adler, for example, has analyzed the influence of organ inferiority in

the life history of the individual, and the great vogue of the "inferiority complex" in recent years should not lead us to ignore the value of his work.⁴ Thus many small men are acutely aware of their diminutive stature, and attempt to atone for it by extraordinary energy, aggressiveness, a loud voice, flashy dress, or other compensations. In similar fashion other bodily peculiarities often lead to the establishment of quasi-protective adaptations, which by no means need be conscious. Many persons, too, are successful in a given field because natural weaknesses in that direction have spurred them on to unusual efforts as a result of which they have overcome the defects with which they started.

(2) *Motility*, or phases of our active or motor life—*general level of activation* (including muscle tonus, nervous tension, threshold for action, and the like), which determines whether a man shall be sluggish or energetic, lethargic or active, lazy or quick to respond; amount and range of *motor drive*, or inventory of objects capable of evoking action, together with the kind of action elicited; *control*, which decides whether activity shall be impulsive or inhibited, diffuse or focussed, vacillating or decided, skillful or awkward; *persistence* under distraction and difficulty; peculiarities of *habit inventory*, including degree and range of stereotyping, ease in forming and breaking habits, etc.

We often think of our friends in terms of their idiosyncratic action patterns. We are reminded of their walk, their smile, the way they use their hands, or we remark how they would act in a certain situation, or what they would say, for these things seem most easily to distinguish them from other people. The manners in which persons of very similar training and abilities will attack a problem often differ remarkably. There is every reason to believe that more thorough physiological studies, chiefly into the functioning of the various glands of internal secretion, will enable us to assign specific reasons for these action differences. In a later section these possibilities will be traversed in the light of the available data.

(3) *Emotionality*, or phases of the life of feeling—*general emotional level*, including prevailing mood, details of re-

sponsiveness to particular stimuli, general excitability, tendency towards contagion of feelings, duration of emotional responses; *variability* in response, including speed of recovery from shock, ups and downs in the emotional life; *apperceptive tendencies*, including levels of interest and concern, degree of focalization of attention, response to distraction, predominant affections, sentiments, biases, and complexes; *taste*, and other esthetic sensitivities; special features of the *fantasy life*; etc.

A man is more likely to think of himself in terms of his feelings than in any other way. "Handsome is what handsome does" is true only if we regard the handsome man from the outside; from within his life might better be summed up in the ebb and flow of his emotional life. We seldom consider ourselves responsible for the things we do "against our will"—we feel that we should be held to account only for what we really *wanted* to do. And yet no part of life, perhaps, is less understood than the feelings, though it is to be hoped that further studies in abnormal psychology may succeed in illuminating these dark places of the soul. Much of normal life is built around fantasy, wish-fulfillment, and those other affective adjustments whose functionings are so often writ large in the activities of the disturbed mind.

(4) *Intellectual equipment*. This topic includes *basic powers*, range and extent of *experience*, and *intelligence*. Among basic powers may be listed such things as sensory acuities, perceptual tendencies (habits of observation), memory, learning habits, manipulative ability, and the like. By range and extent of experience is meant not merely the available stock of information, as well as a knowledge of the sources and techniques for obtaining further information, but also the whole catalogue of situations in which the individual has at different times been placed, with all of their diverse effects, conscious and unconscious, upon his life trends. The student of biography is today in a much better position than the psychologist to present noteworthy additions to our knowledge along these lines.

In discussing intelligence an effort must be made to use the word descriptively, without the ethical connotations that

sometimes adhere to the term. Speaking generally, it may be admitted that intelligence in most of its forms is socially desirable, and it is, of course, positively correlated with many other traits of importance to the group, but the fact remains that many criminals and other social liabilities are highly intelligent, and differ little if at all so far as this quality is concerned from respectable members of the community. Alfred Binet, the founder of the modern mental test movement, seems to have had sound ideas on the subject of intelligence. He named the following as characteristic of successful thinking: ⁵

- (1) The tendency to take and maintain a definite direction when confronted by a specific situation.
- (2) The capacity to make whatever adaptations may be necessary in order to attain the desired end.
- (3) The power of evaluating one's own efforts under such conditions.

It will be noted that Binet takes adequate account of the connection between the initiative or purposiveness of the intelligent man and his power of submission or adaptation to the facts, and that he does not push the problem of intelligence over into the field of ethics.

Thurstone works along somewhat similar lines in his extremely suggestive treatise entitled *The Nature of Intelligence*, where he attempts to come to grips with the mechanics of the problem. He holds that "intelligence is . . . the capacity to live a trial-and-error existence with alternatives that are as yet only incomplete conduct." ⁶ The meaning of this statement should be clear in the light of the discussion of the recession of the stimulus presented in the preceding chapter. It is a feature of experience that we learn to respond to many things anticipatorily, sometimes so long before they are due to appear that our "reactions" to them alter the situation in such a way that they never show up. The dull man has to act everything out to the bitter end before he has an inkling of what it might have been best for him to do, and therefore the greater part of his thinking is retrospective or justificatory; the intelligent man

sees how things are likely to turn out before anything crucial has really happened, and as a result he is frequently in a position to affect the course of events in the direction of his preferences. He does not have to eat all of the egg to discover that it is bad. A dull man does not know enough to go in when it rains; an intelligent man is prepared for the possibility of a shower when the first storm clouds begin to gather. The world of the intelligent man really contains a larger number of genuinely experienced possibilities, since in his experience the future, the past, and the absent are continually throwing light on the near and the now.

From the preceding discussion one might easily conclude that intelligence was a single faculty, present, it is true, in different degrees from person to person, but essentially the same wherever found. Nothing could be farther from the facts. Intelligence is a general name for a large number of partly coöperating abilities, present in varying degrees and combinations in different individuals, and eventuating in diverse powers of understanding and control. It is sometimes conceived, rather narrowly, as though it included only the abilities connected with thought and language, but there seems no good reason why the term should not be extended to take in many characteristically sensory, motor, and emotional processes. The distinction which counts skill in manipulating a pen or the tongue intelligence, but excludes unusual aptitude with the hands or a shovel or a sword or a chisel or a hoe or a graver's tool or an artist's brush, is surely somewhat arbitrary.

The following may be named as indicative of the range of intelligence: *direction* or initiative; *penetration*, including insight (knowledge of what things are in fact) and vision (knowledge of what they might be); powers of *analysis* and *synthesis*, of breaking up and of combining experiences; *resourcefulness*, including imagination, invention, fertility of suggestion, flexibility and calmness in the face of difficulties, etc.; *control*, including powers both general and special for the manipulation of mental and objective materials; *self-criticism*, or balance, impartiality, objectivity, and the like; etc. Really to represent the actual situation, each

of the above items must be taken in the plural, as summing up and suggesting a fairly large number of roughly similar traits.

(5) *Attitudes towards self*—specific *self-feelings* and *self-estimates* of every sort; fundamental *life-plan*; *orientation*, including such things as attitude towards past and future, humor, degree of immersion in one's enterprises, introversion or extroversion; *compensations*, defense mechanisms, and rationalizations; *dissociations* and repressions; etc.

Psychology is indebted to Jung for the distinction between introverts and extroverts.⁷ The introvert finds his chief pleasures and gratifications in the semiprivate world of his feelings and ruminations, while the extrovert is characteristically a man of action and may be as little acquainted with his inner life as a healthy man is with his liver. Edgar Allan Poe seems to have been a typical introvert, whereas Theodore Roosevelt belonged among the extroverted personalities. The self-centered, introverted cat is perennially contrasted with the incorrigibly extroverted dog. In the one case, apparently, we have an exaggeration of visceral and other internal processes and in the other an emphasis on the motor phases of experience. Jung was led to make this interesting distinction, which should certainly not be regarded as setting off two distinct and separate types, but rather as naming the opposite ends of a continuous series of individual differences, by the study of abnormals. Patients suffering from hysteria are usually extroverts, whereas dementia praecox patients are commonly introverts.

Few human beings are able to regard themselves with anything approaching complete objectivity. A man, for example, is not likely to say "I am a shiftless fellow" and really mean just that and nothing more, in the same way as he might point out that it will probably rain before evening. He is more likely to call himself shiftless so that his friend may reply, "Oh, no, you're not," and thus help him the better to endure his defect (compensation); or he may really be intimating that it is a rather fine thing to be shiftless (defense mechanism); or his utterance may be the prologue to an explanation of how he came to be what he is (rationaliza-

tion). And, of course, a man may be shiftless and undependable and never once suspect the fact (dissociation). It is not necessary to assume that men who act in any of these ways are hypocrites. They just as frequently fool themselves as others. The rationalizer often is unconsciously persuading *himself* that things are not what they seem—and he usually wins the argument.

(6) *Social attitudes—sociability*, including adaptability to others, consideration, the social graces, etc.; *suggestibility*, or responsiveness to social stimulations; *morality*, or degree of accord with prevailing group expectations; *character*, or personal ethical status; *anti-social trends*, as against sex, public order, the persons of others, property, etc.; degree of *participation* in the activities of the group; etc.

Fields for the further study of personality

So little is known in academic circles about the concrete way in which a specific human being is likely to act in a given situation that one might expect to learn more about the handling of practical problems of conduct from the ward politician or the parish priest than from the psychologist or “student of human nature.” Many men have a pragmatic knowledge of their friends which is of much greater value in helping them to understand other people than anything which they might learn through the most assiduous study of the existing literature on personality. And yet there are a half dozen or more distinct lines of approach to the study of this subject that promise a rich harvest in the near future.

(1) *The influence of heredity*. Much work has been done on the inheritance of physical and mental defects, and a few studies have been made of men of genius, but to date only the broadest and most general aspects of the subject have been touched.⁸ Individuals are listed as feeble-minded, alcoholic, criminal, epileptic, or the like, and while much valuable data for the determination of social policy have thus been gathered, and many of the broader and more significant laws of human heredity suggested, the material has seldom permitted fine enough treatment to be of much use in elucidating the problems of personality. It may be that

heredity will always be too blunt an instrument for the dissection of such delicate tissues, but we can certainly expect to know more than we do at present respecting the precise effects of hereditary influences in the life of the individual. Even now much that is important from this point of view is available. For example, a man who inherits hemophilia, or inability of the blood to clot (a trait exhibited only in males, although it can be transmitted from one generation to the next only by females), will certainly have to live a different life than the ordinary individual, since even a trifling cut may prove fatal; but in addition the fact that this trait is sex-linked in the manner described suggests that it may be associated with other hereditary elements into a complex inheritable whole. No study seems ever to have been made of the general mental incidence, whether hereditary or acquired, of such a condition.*

(2) *The processes of mental development.* Only the obstacle of expense seems to stand in the way of taking a small group of children (either one by one or as a body) straight through from birth to at least the age of three or four under perfectly normal though controlled conditions with full provision for a record of all significant happenings, for thorough prognoses of the future upon the basis of this experience, and for the eventual checking up of these forecasts in the light of the actual biographical outcomes. Such a project would cost a great deal, but it would probably be well worth the expense. Lacking so thorough an enterprise, it is to be expected that the many smaller studies being conducted into different phases of mental development will continue to throw light upon the emergence of distinctive personality traits. In recent years, for example, a considerable number of investigators have attempted to determine the vocabularies or the store of meanings possessed by children of

* It will be noted that this is essentially similar to the problem of the existence of an instinct, except that: (1) no claim is presented that these inheritable complexes are to be found in all men alike; (2) it is not asserted that they are capable of occurring without the continuous coöperation of environmental factors, (3) it is suggested that their existence might be disclosed, if at all, by detailed biological investigation, rather than by a survey of the more general features of human behavior.

various ages; and even the casual records which parents have kept of the general mental growth and development of their children often include much data of value with respect to the emergence of personality. An effort was made to utilize a part of this material in the writing of this book.

(3) This leads to the consideration of personality data disclosed through one or another kind of *literary study*. The initial approach here may be biological or analytical. The student may begin with the man, and view his productions through the medium of an understanding of his life, or he may start with his works, and construct a picture of their creator through an interpretation of his creation. Much can often be done through the mere analysis of the literary products quite in their own terms, without reference to their source. The modern biographer who is thoroughly equipped with psychological insight finds it within his power to contribute powerfully to the better understanding of human personality, as is strikingly shown by a comparison of Krutch's excellent study of Edgar Allan Poe with earlier biographies of that remarkable man.⁹ Krutch thoroughly demonstrates the futility of attempting to separate Poe the genius from Poe the victim of tragic mental maladjustment, and many times over furnishes a key for the interpretation of otherwise inexplicable features of his literary productions. He is able to place Poe's critical work, his strangely haunting and coldly passionate verse, his mystery and detective stories, his ever recurrent interest in mechanical chess players, secret codes and the like, his ridiculous "philosophy of composition" with its totally unconvincing explanation of how he wrote "The Raven," his pseudo-scientific writings, and the details of his pitiful life all together in one luminous setting, so that they mutually explain each other. Work of this character promises greatly to enlarge our specific acquaintance with the varieties of human experience.

In this connection great credit is due the psychoanalysts, quite apart from the specific nature of any of their contributions to dynamic psychology, for they have developed techniques and attitudes suited to biographical research that will prove increasingly useful even to persons who do

not accept all of their psychological assumptions and conclusions. These physicians of the soul have enriched our conceptions of human nature—and that, too, curiously enough, through the use of ideas which many outsiders have been led to criticise as leading to stereotyped and narrow notions of our psychic life.

(4) *Influence of social structures and standards.* A more detailed research into the types of individuality to be found in different social groups would be of immense assistance in elucidating the problem of human personality. Anthropologists are just beginning to take account of such phases of their data as bear upon problems of individual psychology, and this material is bound very decidedly to supplement their earlier general descriptions of rituals, material culture, social organization, etc. Even this earlier more external body of descriptive materials often yielded vivid pictures of real persons actually carrying on the diverse enterprises of their lives in terms of strange arrangements and notions, until the student could not but believe that these members of alien cultures must be different men and women from himself as a result of it all, but little detailed evidence to that effect was available except at great cost of time and trouble. It is a fine thing that the investigators of primitive ways of life at last see their way clear to make this sort of information more easily accessible.¹⁰

The comparative study of civilized groups or the thorough and painstaking analysis of the psychological incidence of the materials of a single civilized culture would also clarify our ideas of personality. A great deal of unmitigated nonsense has been written on "the Greek mind" and other similar topics, but all the evidence seems to indicate that the peoples of other cultures than our own could not possibly have looked at themselves or the world in precisely our fashion. Time and again, as we read the literature of the Greeks, we are brought squarely against something that seems inexplicable when stated in the terms of our usual categories of thinking or feeling. Aristotle's *Ethics*, when seriously studied, frequently leaves one thus puzzled—and this can hardly be because Aristotle was Aristotle, but

rather because Aristotle was a Greek, for it is beyond question, as Aristotle himself recognizes, that his *Ethics* is in the main an expression of views commonly accepted in his day.¹¹ When we endeavor to take account of such differences, however, after we have discovered by an act of sympathy what they seem to be, we usually do nothing more than imagine the new item added to the total content of our lives, which remain unchanged except for this addition. Thus we may think of ourselves as being supremely anxious, like Antigone, to fulfill the burial rites of a dead though traitorous brother by throwing at least a handful of dirt upon his corpse; and so we permit this idea to hover impotently before us while we read Sophocles' play. But to a Greek we may be sure that this notion was not an isolated atom of information to be remembered, but a vivid feeling dynamically capable of evoking many different ideas, sentiments, and actions.

The same difficulty of understanding arises even with respect to peoples who are contemporaries and in more or less intimate contact with each other. In subtle ways the impression of the group life will make itself felt throughout the whole range of a man's life. One does not have to be educated or intelligent to be molded by these pressures; they are as gently ubiquitous and as life-sustaining as the very air one breathes. In this way one nation is differentiated from another;¹² and in this way also even persons who live within the same society are differentiated by their several callings and vocations into groups betraying the same general mental makeup. We often find it extremely difficult to understand or handle ideas having their origins in life-settings different from those to which we are accustomed, as Bosanquet graphically points out:¹³

An idea is a complex but definite habit and effort of thinking; to apprehend an idea requires, in varying measure, courage, strength, practice, skill, and above all, patience. . . . The reason why I cannot use the differential calculus, is on the whole, the same as the reason for which I cannot play the violin. Both of these activities require skilled and sustained effort of a kind which I have never learned to make. . . . Luckily, not all ideas are as hard to grasp as the calculus. . . .

But all ideas whatever present difficulties of apprehension such as are presented by these. An idea is a portion of life and you must not hold it cheaper.

Since one of the chief purposes of this book is the better understanding of the manner in which social structures and standards enter into and constitute the human individual, further detail of the possibilities in this direction can be found in nearly every chapter.

(5) *Physiological research*, especially into the functioning of the visceral organs and the glands of internal secretion.¹⁴ Glands are cell colonies given over to the manufacture and secretion of substances which are either excreted from the body as waste or else affect the operation of one or another bodily organ. Two kinds of glands are usually distinguished—duct-glands (including the two million or more sweat glands, the salivary glands, glands of the stomach, pancreas, liver, and similar structures), which emit their secretions from either the external or the internal* surface of the organism; and ductless or endocrine glands, which pour their materials directly into the blood stream. It is to the latter group that we shall direct our attention.

We really know very little about these glands of internal secretion. So much nonsense has been written about the endocrine glands, so much has been asserted as proved concerning their operation that is at best only problematical, and they have been made responsible for so many of our sins and achievements, that a certain unwillingness to consider them seriously as factors in the life economy is sometimes noticeable among cautious people. The little that we really do know, however, is enough to demonstrate that their influence on growth and development and on the round of life activities is indeed very great. Their various secretions accelerate or retard specific organic processes, and any lack of glandular equilibrium shows itself in irregularities and abnormalities of over- and under- development. Without attempting to describe the glands themselves or the chemical properties of their secretions, we shall

* The surface, that is to say, to which the mouth and nose give entrance.

indicate some of their known effects in the human being. All of these glands are very small in proportion to their importance, and secrete only minute quantities of their activating substances.

(a) *The thyroid glands* (in the neck). Removal or degeneration of these glands (*hypothyroidism*) arrests bodily growth, especially of the skeleton, diminishes sensitivity, retards mental development, lowers metabolism, and produces abdominal obesity. The skin becomes cold and dry, the hair falls out, nails become brittle, teeth loose and poorly calcified; muscles flabby, and constipation frequent. If the subject is a child, the peculiar form of mental deficiency known as cretinism results. These conditions can be remedied in whole or in part by regular feeding with thyroid substance.

An excess of thyroid secretion (*hyperthyroidism*) results in an increase and irregularity in pulse rate, excessive metabolism, nervous excitement, anxiety, and restlessness. When thyroid secretion is fed to tadpoles, minute frogs, complete and mature in every respect but no larger perhaps than a pinhead, are produced. In the female the gland is enlarged at puberty, during the menstrual period, and at pregnancy.

(b) *The parathyroid glands* (near the thyroids). These glands are necessary to life, and their removal or degeneration leads to the sudden involuntary muscular contractions and spasms characteristic of tetany, together with general emaciation and loss of weight. They probably help to maintain bone metabolism, since their degeneration in the young keeps the skeleton small, and there is a slow healing of fractures. The injection of calcium gives relief.

(c) *The adrenals* (near kidney). Death follows the removal of these glands. A deficiency in adrenal secretion gives rise to the condition known as Addison's disease, which is usually fatal in two years. The patient is chronically tired, his muscles are weak, heart action feeble, there is loss of appetite, emaciation sets in, and the skin bronzes to a characteristic hue.

An excess of adrenalin (the secretion of the medulla or inner part of the gland) quickens the heartbeat, contracts

the arteries, raises the blood pressure, releases sugar into the blood (from the liver, which stores it away as a body fuel), and tones the muscles, making more work possible with less fatigue. Adrenalin in general acts like an excitant of the sympathetic part of the autonomic nervous system. The adrenal glands are especially active during emotional excitement, and some investigators go so far as to assert that nearly all the phenomena of the emotions will be explained when more is known about their operation. The adrenal glands are probably connected in some way with the sex functions, for they are enlarged during pregnancy, and tumors of the adrenal cortex (or outer portion) are frequently associated with precocious sexual development.

(d) *The pituitary gland* (at base of brain). Removal of this gland results in death within a few days. Deficiency or degeneration retards growth and leads to obesity, especially in the young, and inhibits sexual development. Excessive functioning leads to greater skeletal growth, and is a cause of giantism. Extracts from the posterior lobe of the gland activate the involuntary muscles of the intestine, bladder, and uterus.

(e) *The pineal gland* (in center of brain). A deficiency¹ in this gland in children causes rapid sexual development and increased skeletal growth.

(f) *The thymus* (in neck). This gland is also apparently connected with sexual development, as it increases in size and weight up to puberty, after which time it again becomes smaller.

(g) *The sex glands* (in organs of sex). These furnish both the external seminal secretion necessary to reproduction (from the gonads), and an internal secretion (from the interstitial cells) which seems to be in chief control of the traits peculiar to sex, and to activate the changes incident to puberty. All the corollaries of sex, direct and indirect—and these are to be found throughout the body—are primarily connected with the functioning of these interstitial cells. Where they do not operate with normal strength or have been removed, the two sexes tend to approximate each other in physical and mental traits. The interstitial cells

also appear to be one of the chief factors in maintaining the youth and vigor of the whole body:¹⁵

The puberty gland seems to be mainly responsible both for sexual vigor and sex aggressiveness, and for the youthfulness and activation of all the other glandular systems of the body. At any rate, there is a growing tendency on the part of investigators (possibly in the absence of critical proof) to believe that man is as old as his glands. And since the remaining glands apparently cannot stay youthful in the absence of a sufficient output from the puberty glands, it is only natural to connect senescence or old age with a decline in the output from this gland.

As a consequence efforts have been made in recent years to find the fountain of youth in these glands. The various attempts at rejuvenation cannot to date be called very successful, although a promising field for further study is here indicated.

The above paragraphs briefly summarize the main features of our present knowledge about the glands of internal secretion, in so far as it seems capable of helping us to understand the whole man in action. Future work in this field will no doubt reveal much of importance for the better understanding of human personality.

(6) *Abnormal psychology as an index to normal personality.* Students of the normal individual have made far too little use of the data furnished by the investigation of mental aberrations and deficiencies, both because such materials must have seemed irrelevant to an acquaintance with the highly rational individual assumed by former psychological systems, and because abnormal psychology has as yet hardly emerged from the classificatory and descriptive stages. Contrary to common opinion, the abnormal mind is never a complete jumble. When a patient "says anything that comes into his head," his speech is not random and never fails to disclose trends and continuities not fundamentally unlike those of normal people. Sometimes the patient's processes are even more ordered and logical (inside their premises) than those of his fellows. But certain attributes and tendencies of human nature appear in greater relief

when they are studied as they occur in abnormals, and the significance of many of our normal powers for the first time becomes clear when we view the disorganizations that follow their degeneration or disappearance. There is of course a pathological and morbid interest in pathology that is not entirely healthy, but many interesting things about human nature are suggested by a study of defective individuals.

The range of mental defects and aberrations is, of course, extremely great. Any portion of any reflex arc, or any group of reflex arcs, can become disordered as a result of disease, degeneration, poisonous substances, shock, or other interferences with normal operation; and in addition there occur the so-called functional disorders, which correspond to no known anatomical distribution of nerves. Instead of attempting to cover this whole field in detail, in the paragraphs that follow free use has been made of a suggestive and valuable organization of a large part of the data recently published by Dr. A. J. Rosanoff.¹⁶ Dr. Rosanoff divides abnormals into four main groups, each showing tendencies and traits which are also to be found, often in fairly exaggerated form, in normal human beings. These abnormals, in other words, are not sharply distinguishable from regularly endowed human beings, all grades of excess and deficiency of the qualities under consideration making their appearance in different human beings. The distinction between abnormals and normals is not clean-cut. Pathological cases, for instance, do not always require supervision, whereas normals sometimes do. In general, however, most normals possess a higher degree of "inhibition, emotional control, a superior durability of mind, rational balance, and nervous stability."

The abnormal types of personality of special significance to an understanding of normal human beings distinguished by Dr. Rosanoff are as follows:

(a) *Antisocial*—the constitutional basis of hysteria, which involves a narrowing of the conscious life due to the dissociation of a group of reflex arcs from the main stream of reflex activity. The patient may be able to feel no sensations

from his hand or his arm, or his visual field may be extremely contracted, etc. These dissociated elements retreat, as it were, from contact with the world. Rosanoff states that this group betrays a "predominance of illicit selfish motivations" and a "more or less pronounced lack of compunction," and that such persons form the group of chronic malingerers, pathological liars, and inveterate swindlers.

(b) *Cyclothymic*—the constitutional basis of manic-depressive cases, which are characterized by fits of excitement or melancholy, or both. Rosanoff distinguishes four classes—manic, depressive, irascible, and emotionally unstable. Many normal individuals can testify to more or less extended periods of elation or of retarded activity, the reasons for which resist all of their efforts at explanation.

(c) *Autistic*—the constitutional basis of dementia praecox. These persons show a narrowing of external interests and contacts, progressive apathy for the things of this world, and preoccupation with internal ruminations (*cf.* introversion). Delusions are common, and the condition is usually progressive.

(d) *Epileptic*—given to strong unreasoning likes and dislikes, impulsiveness, extreme variability of feelings, craving for self-expression, etc.

The normal individual frequently shows pronounced traces of these abnormalities, and they are often noted in children who later outgrow them. The reader should have no great difficulty in identifying persons from among the circle of his acquaintances who exemplify fairly unusual degrees of excess or deficiency under each of the four heads given above. Any degree of intellectual capacity may coexist with any of the above temperamental states, though the relative frequency of feeble-mindedness increases as one passes from normals to manic-depressives to dementia-praecox cases to epileptics.

It must be repeated that highly abnormal persons are not always social liabilities. The sensitiveness and power of expression of highly cyclothymic personalities (as Poe and Nietzsche) have given us great literary masterpieces, and many pioneering souls have been of this type. The great

philosophers have often been surprisingly autistic (as Kant, Spinoza, Archimedes), and much literary work has had an epileptic origin (as Flaubert, Dostoevsky). Nor have the great of this world been entirely free from antisocial tendencies.

The whole man in action

In this chapter an effort has been made to view the whole man from enough different points of view to gain a reasonable idea of the great complexity of a developed life. No bodily processes are simple, and the complexities involved in thought and concerted organic action are astounding. No person ever quite succeeds in defining or distinguishing the *body*, the *me*, the *mine*, and the *not-me*. We flow out into the things that surround us and incorporate into our selves our clothes, our family, our home, the climate and scenery of the place where we have long lived, and countless other "environmental" processes. At the same time we reject and disown many of the processes that indubitably do go on within the organism. Our personalities can even be shown to contain elements derived from other minds than our own, as when a man is made by his friends, who insist so strongly that he is something that he is forced to become that thing in order to save his self-respect.

Finally, the sphere of the self is almost constantly changing. We lay claim to things at one moment, and ignore them during the next, and in addition to these short-term fluctuations there can often be plotted long-time secular trends or tendencies in a man's personality. In fact a man's life usually exhibits a considerable number of partly unified movements in varying directions, centering around a few somewhat more fixed points. Essentially the proper idea can be gained by a study of a series of photographs of the same individual taken at different times under varying circumstances. It is perhaps not difficult to see that they are all of the same person, and yet the differences are also very apparent and often extremely interesting. They reveal the influence of the various life-periods, of the growth and decline of fashions and fads, of the slow development of mannerisms and tastes, and of the various social affiliations that

have been formed, either to decay or to increase in strength with the passage of time. A man's self is formed in all these and in many other similar ways.

REFERENCES

¹ For an important and typical case see Morton Prince, *The Dissociation of a Personality, A biographical study in abnormal psychology* (2 ed., Longmans, Green, 1913).

² G. Udny Yule, in *Brit. Journ. of Psych.*, Vol. 12 (1921-1922), 106.

³ Valuable discussions of various phases of personality are to be found in F. H. Allport, *Social Psychology* (Boston, Houghton Mifflin, 1924), 99-125, and in J. B. Watson, *Psychology from the Standpoint of a Behaviorist* (2 ed., Phila., Lippincott, 1924), 412-440.

⁴ Alfred Adler, *Study of Organ Inferiority and Its Psychological Compensation* (N. Y., Nervous and Mental Disease Pub. Co., 1917).

⁵ Alfred Binet, *L'intelligence des imbéciles, L'année Psych.*, 1909, 128 f.

⁶ L. L. Thurstone, *The Nature of Intelligence* (N. Y., Harcourt, Brace, 1924), XV.

⁷ See Carl Jung, *Psychological Types, or The psychology of individuation*, trans. by H. G. Baynes (N. Y., Harcourt, Brace, 1923). Cf. also William James on the tender-minded and the tough-minded, in his *Pragmatism* (N. Y., Longmans, Green, 1907), Lecture 1.

⁸ See the summary and bibliography in Carl Kelsey, *The Physical Basis of Society* (N. Y., Appleton, 1916), 233-275.

⁹ Joseph Wood Krutch, *Edgar Allan Poe, A study in genius* (N. Y., Knopf, 1926). Equally valuable is H. P. A. Fausset, *Samuel Taylor Coleridge* (N. Y., Harcourt, Brace, n.d.).

¹⁰ See, e.g., Robert H. Lowie, *Primitive Religion* (N. Y., Boni and Liveright, 1924), esp. Chapter 11; Paul Radin, *The Autobiography of a Winnebago Indian* (Berkeley, Univ. of Calif. Press, 1920); and the attractive stories and reconstructions of the Indian scene in Elsie Clews Parsons (ed.), *American Indian Life* (N. Y., Huebsch, 1922).

¹¹ This has been shown by Rhys Carpenter, *The Ethics of Euripides* (N. Y., Columbia Univ. Press, 1916). Aristotle himself conceived it to be the essential duty of ethics to establish the accepted views regarding conduct (cf. *Ethics*, Book 7, Chapter 1). For other data on peculiarities in Greek conceptions, see the writings of F. M. Cornford, esp. *From Religion to Philosophy, A study in the origins of western speculation* (London, Arnold, 1912).

¹² For a sympathetic yet objective description of one contemporary group by a member of another, see Robert Dell, *My Second Country (France)* (London, Lane, 1920).

¹³ Bernard Bosanquet, *The Civilization of Christendom, and other studies* (London, Sonnenschein, 1893), 185-186.

¹⁴ The interested reader may consult Benjamin Harrow, *Glands in Health and Disease* (N. Y., Dutton, 1922); L. Berman, *The Glands Regulating Personality* (N. Y., Macmillan, 1921)—to be used with caution; J. B. Watson, *Psychology from the Standpoint of a Behaviorist* (2 ed., Phila., Lippincott), 190-213; or E. Sharpey-Schafer, *The Endocrine Organs, An introduction to the study of internal secretion* (2 ed., Part I, London, Longmans, Green, 1924).

¹⁵ Watson, 209.

¹⁶ A. J. Rosanoff, A theory of personality, *Psych. Bull.*, Vol. 17 (1920), 281-299.

PART III

HUMAN NATURE AND SOCIAL COMPLEXES

Chapter IX

ROUTINES

Just as certain features of contemporary life can best be grasped through a study of the processes of individual development, so other aspects yield more easily when they are attacked through a consideration of one or another of the great social complexes that enter so deeply into human living. Here again the approach can be broadly synthetic, as it will be in this part, where the discussion centers in order about routines, tools, language, values, common sense, and innovation, or it can be analytic, as in the part that follows, where such topics as the family, economic institutions, art, science, and religion will be considered. The division of the discussion into parts in which the direction of attention shifts somewhat is dictated by convenience, and is more closely connected with the form of the available data than with intrinsic differences in subject matter.

The round of life activities

Every group on inspection will be found to be engaged in running through a fairly regular cycle of life activities in which essentially the same situations are faced again and again after varying periods of time. Many features of this rhythm of reactions are based upon purely physical recurrences, for we live in a world in which the days, months, seasons, years, follow each other with great regularity, bringing before us, not the same things over and over again, it is true, but things very similar to those that the same stage of the cycle brought in times past. Likewise, the plants and animals upon which man depends for his food have each its peculiar rhythm to which he must adjust himself throughout all his days. In countless ways life becomes adapted to this somewhat intricate yet ordered interweaving of natural recurrences. With the rising of the sun we

rise, when it rests overhead we rest, and when night falls we once more change the patterns of our lives. Spring, summer, autumn, and winter have written themselves deeply into our hearts, and it is not for nothing that we note birthdays and the passing of the years. The rhythms of the world have become the rhythms of our lives, and overlay but do not obscure those other more private rhythms of breathing, hunger, fatigue and rest, sex, temperament, and the like. And to all these life-tides a culture adds yet other goings and comings, doings and restings, flyings and perchings, swimings and sinkings. A wise man it was who compared our life unto a dance.¹ Or so at least it becomes to those favored souls who succeed in shaping the eternal rhythms into a gracious and beautiful pattern, deadened neither by monotonous repetition nor shattered into incoherent disorganization. For most of us, perhaps, life is not a dance, but rather a *ménage* jointly presided over by disorder and routine. Our lives are not so much a delicate and balanced imbalance as a dull and stodgy trudging all too frequently interrupted by a stumble or a fall.

It is not easy to estimate the degree to which routine affects our lives, though some idea of its extent can be secured by following a member of our group straight through a typical day. He rises promptly, though not without a customary yawn, when the alarm rings at seven-fifteen, dresses and shaves according to a schedule that does not vary more than a minute or two from one day to the next, winds his watch, goes to the front door and gets the morning paper, which had been left there by the boy at seven-four, and sits down to breakfast—which has in the meantime been prepared by “the good wife,” as he would say—and the sporting page. His wife inquires about the weather for the day, the while he finishes his cereal (Grape Nuts on Mondays, Wednesdays, and Fridays, Corn Flakes on Tuesdays, Thursdays, and Saturdays, with oatmeal on Sunday for a change), glances at his watch, and turns hastily to his egg, toast, and coffee. At five minutes to eight he rises, kisses his wife (if he has that habit) while putting on his coat, and half runs to the station, the newspaper in one hand (if he is

one kind of husband—without it, if he is the other), and just catches the eight-three. This carries him to the city, where he takes the subway to the office, which he reaches at five minutes past nine. There he works over the day's orders, which differ not by a hair's breadth from those of the day before, until twelve (or one, as the case may be) when, made hungry by habit, he descends to the street for lunch. He is back again after an hour and five minutes, and returns to his work, which occupies him until five o'clock, when he hurries to the station, buying his regular evening paper on the way, and arrives there just in time to catch the five-nineteen. Home again, he lies around until supper is served (soup, meat, two vegetables, dessert, and coffee), after which he has the choice of fiddling with the radio or working in the garden. This, however, being Wednesday, at a quarter to eight he takes his wife down to the moving picture theater, arriving there just in time for the first show, which keeps him out of mischief until nine-thirty. He has seen the news reel (parade of Elks in Chicago, battleships steaming into San Francisco harbor on world cruise, dog show on Long Island, return of North Pole explorer), the "comic" (with its swerving auto chase in a crowded street and its roguish vamp), and the feature drama (showing that virtue is rewarded, but entitled "Why Women Sin"). The show over, he returns home and sits around until bedtime. And so the routine goes—except for Sundays, for on Sundays our man will have his breakfast later (with oatmeal), and a little while thereafter, if the weather permits, will get the car out of the garage, and he and his wife will go for a drive until they find a nice quiet spot where they can read the Sunday paper in peace. If it is a bad day, they stay at home and read the paper there, or turn on the radio and, after listening for a few minutes to the regular Sunday service, shift the dials so that they may hear "some good music."

Fatigue and monotony in modern life

Is this man a myth? The answer is undoubtedly yes, if no other factors than those which went into our description were to be considered. The life of but few persons is so

completely stereotyped as that of our imaginary suburbanite, and yet, as he himself would probably phrase it, he wears the same size collar as many a man who actually exists. Into the lives of many men variation enters only when accident interferes with the normal routines. And in some respects the situation of our highly routinized man is actually better than that of many people, for his life, though monotonous, is not otherwise so fatiguing as that of millions of workers under the conditions normal to contemporary industrialism. Monotony and fatigue divide the responsibility for many of the abnormalities of modern life.

Fatigue is usually defined as decreased efficiency due to work and remediable by rest; and it is often though not always accompanied by a definite *malaise* or unpleasant feeling tone. Fatigue is caused primarily by the release of acid poisons into the blood stream at a faster rate than they can be removed (toxic fatigue), or by the consumption of the stored food materials of the body at a greater rate than they can be replaced (metabolic fatigue). Toxic fatigue can be induced in a rested animal by blood injections from one that is tired. The effects of fatigue include decreases both in quantity and quality of work, a decline of interest and a wavering of attention, increased susceptibility to accidents and lowered bodily resistance, an increase in emotional strain and irritability, and, if extreme or long continued, complete inability to act. Rest under healthful conditions is therefore not a period of inactivity, but rather a time when these conditions are being altered through the removal of waste poisons from the system and the restoration of body fuels. If, however, for any reason the situation is such that these functions cannot be performed during the periods of rest, the organism is slowly poisoned and starved, and a variety of systemic disorders make their appearance. Among these are the nervous troubles so characteristic of our age—the anemias, neurasthenias, cardiac disorders, indigestions, headaches, and other characteristic ills of modern life.

Fatigue is more quickly induced by monotonous than by varied tasks, by work than by play, when the work is uninteresting and offers few incentives to human effort, when

the workers are untrained, in poor physical condition or under emotional strain, etc. Some fatigue is, of course, an almost inevitable consequence of human activity, and is by no means biologically undesirable, but the charge is brought against modern industry that it generates in machine workers a chronic fatigue state which prohibits them from living healthy, normal lives. The reasons for this are numerous. The hours of work are often still far too long, in view of the attention and application that must be maintained, as is strikingly shown in nearly all lines of activity by a considerable decline in productivity towards the end of the day and the end of the week, as well as by the increase in the accident rate at these times. The conditions of work are seldom entirely satisfactory, as respects ventilation, light, noise, and similar factors. The din of many machine operations is nearly deafening, and in itself constitutes a great drain upon the vital energies of the worker. Then too, the work is fitted to the needs of the machine, and the worker must adjust his speed of action to the much quicker rhythms of his apparatus. There is little or no variety in his motions, a fact which helps greatly to make them fatiguing, and they must usually be made at a forced pace. And on top of all this the worker is likely at all times to be more or less worried about his tenure of office, while more often than not he has not the slightest intrinsic interest in his task and possesses only the meagerest acquaintance with his personal rôle in the industrial system of which he is an infinitesimal part. Nor is the situation alleviated if we follow the workman home from the factory. The conditions under which he lives are seldom such as to help him throw off the fatigue and *ennui* of his daily labor, for he must make his home in a densely overcrowded and often extremely unsanitary district provided with but few of the means for individual release and development.

This description has been made to apply principally to the industrial worker, but a very similar account might be given of the plight of thousands of agricultural workers and of yet other hordes of people holding business positions. The conditions under which telephone girls often work, for example,

are such as to submit them to terrible psychological strains.² The whole business has grown up since 1876, and employs picked workers (more than one-third of the applicants sometimes being refused). Working conditions—ventilation, rest rooms, luncheons, and other welfare activities—are generally rather better than in other industries. It is the nature of the work itself that raises grave psychological difficulties, for it taxes the powers of attention to the extreme, and places great burdens upon vision and hearing, besides calling for a surprising amount of muscular exertion and no end of forbearance under very trying conditions. So extreme are the drains upon human energy that a Canadian commission as a result of thorough investigation recommended that girls be employed for a maximum of six hours, the time to be interspersed with rest periods and spread over a period of eight to eight and three-quarters hours. In 1910 the average hours of work in the United States at this job were eight and a half hours per day, and the usual arrangement gave but one day's rest every fortnight.

The incidence of the labor conditions of civilized life can be seen in the kind of recreations people of today tend to seek. They are driven by the unrelieved irritations of their psychic life to search for thrills, for excitement and intensity of stimulation, and they are in great measure rendered incapable of those slow processes of self-improvement that might help them either to better their condition or make it more endurable.* They rush down to Coney Island and ride on the roller coaster or slide down the shoot-the-chutes, they patronize prize fights or go to the ball game to see Babe Ruth knock a home run with three men on base, they crowd to torrid dramas of sexy souls, their glances wander to forbidden fruits, they chase that elusive will-o'-the-wisp Pleasure down many a tangled way. Now these things may all be excellent in their several ways, and the man who sees absolutely nothing in them stands a good chance of living

* It is of course not clear that the recreations were in every instance more elevating when life moved more slowly. There is not much difference between bear-baiting and prize-fighting in this respect. To those who are in a position to use them, our culture offers plenty of opportunities for self-improvement.

a narrow life; but the person who sees nothing in anything else is living in a fetid prison of the mind, even though he has been driven there by the exacerbations and monotonies of an over-routinized and highly mechanized culture.

The necessity of routines

It must now be pointed out that men can get nowhere without submitting themselves to a great deal of routinization. A large part of every man's life must be given over to the repetition of functions, and it is not written in the book of nature that all of these travelings over the same ground shall be pleasant. Much will always depend upon the doing of things that have been done before, and many of our activities would hardly be possible if they were not thoroughly synchronized. Man has developed entirely artificial time units, such as the hour, the minute, the second, and the week, upon the basis of such natural time spans as the day, the month, and the year.³

When we consider the fact that the industrial system, including the scale of wages, is regulated by time; when we think of the impossibility of a safe and convenient system of transportation without time tables and all that they imply; when we think of social engagements and their dependence upon the ability to name days and hours; when we recall that religious festivals have been one of the chief centers of interest in the making of the calendar, we begin to realize what time measurement means to civilization. . . . The impressive fact about the modern method of life is that it finally takes so firm a hold on the individual that he becomes a living embodiment of the social demand that everyone guide his conduct by the clock.*

One is reminded of the Lilliputians, who concluded that Lemuel Gulliver's watch must be his god, since he never failed to consult it before engaging in any enterprise.⁴

One of the chief functions of a precise time notation is its usefulness for the recording of scientific observations, many

* C. H. Judd, *The Psychology of Social Institutions*, 105-6. Copyright, 1926, by The Macmillan Company. Reprinted by permission.

of which depend upon our ability to make very small (and in some cases very large) temporal discriminations. In connection with scientific research, time and space have been minutely subdivided. Thus the Hipp chronoscope, which records thousandths of a second, is used in psychology for the measurement of reaction times, while the interferometer, a far more precise instrument, is employed to measure possible minute differences in the speed of light waves according as they travel across or with the supposed drift of the luminiferous ether. On the other hand, units have been developed for the measurement of geological periods lasting for millions of years, such as the rate of salinification of the sea or the rate at which radium decomposes to form lead. Space has been similarly divided, from such minute measures as the Ångström unit (which equals 10^{-10} meters, or one-millionth of .003937 inch), up to such distances as the light year, or the distance traversed by a light ray in a year when traveling at a speed of 186,000 miles a second. The progress of scientific discovery would be severely hindered if these measures, as well as others for volume, weight, density, pressure, energy, etc., were lacking, and they depend, of course, upon earlier and cruder measures developed in connection with ordinary everyday needs.

But routine of necessity penetrates more deeply into our lives than through its connections with temporal, spatial, and other measures, whether of science or of common experience. Forces both personal and social are always actively pushing towards uniformities and repetitions in human behavior, and the whole inertia of individual and group life also tends to have the same effect. Even the changes which do take place within a culture usually conform to certain fixed trends peculiar to that culture, so that its line of advance is as thoroughly laid out and routinized as its conformities.*

* A friend informs me that young physicists who are not working on the structure of the atom are regarded by their colleagues as "out of the swim." Students of the social sciences are all too familiar with the fashions that wax and wane within their domain of interest. At one time it is intelligence tests, at another the conditioned reflex, or the use of statistics, or the geographical interpretation of history, or the doctrine of social forces, or instincts, or evolutionary preconceptions, etc.

Psychological forces upholding routines

(1) *Emotional attachment to the existing order.* Our feelings usually bind us strongly to the existing arrangements, which are well known and familiar to us, and therefore valued. If the folkways involve risks and disadvantages, these at least have the merit of appearing commonplace, and are usually taken for granted, whereas the alternatives are vague and disquieting.⁵ In addition, it often happens that even those features of our lives that we grumble most against are actually very dear to us, so that we would not see them changed for the world. We are anxious to have things ordered differently—but only providing nothing is changed. Finally, efforts to substitute a new way of acting for an old are often highly fatiguing, since they must move against all the inertias of an established régime, and in most instances the effort required to institute a change speedily satisfies us that the old routines are good enough after all. In these several ways it usually happens that we are strongly attached emotionally to the prevailing arrangements.

(2) *The intellectual bias towards uniformity.* Reference has already been made to our partiality for orderly experiences. This is a surprisingly ingenious device for retaining practical control over the materials of our environment with a minimum expenditure of nervous energy. We usually pay just enough attention to things to place them in relation to ourselves and the other items we are required to handle in making our way from one situation to the next. It is as though the several items lying about us had been catalogued and labelled with reference to their general bearing on our various life activities, leaving us free to react to them, in terms of their simplified labels whenever they recur in experience. Thus we seldom really look at a friend; a glance suffices for identification, and we are saved the trouble of a closer inspection. We make our way through life largely in terms of the abbreviated clues furnished by things, and would frequently be at a loss to describe the general structure of objects we use every day. An art critic once remarked that pictures were among the very few things that men ever took the trouble really to inspect. We are usually

content to identify rather than to particularize, to see a thing as one of a kind rather than as a distinct individual.

This has the effect of simplifying our experiences, and of introducing into them a larger measure of routine than they might otherwise contain. It would, of course, be idle to expect men to awake to a vivid realization of the novelty and variation that lie hid in their commonest experiences, for this is to ask them to become poets; but by sitting at the feet of the poets they may now and again be helped for a moment really to apply their senses to the things of the world. Our language is full of burnt-out metaphors, but these do not satisfy the poet; he wishes first to fire his own imagination and then that of others, and these extinct craters of once vivid feeling are of little value for this purpose. So he spends much of his time searching for the living and true expression, both because he likes the *feel* of words and because through them he escapes the dead dullness of stereotypes. This effort, however, does little to increase his practical control of the environment—in many instances, especially where social conditions are unfavorable, it works to make the poet an ineffectual dreamer.

It is of course true that our lives are usually more thoroughly routinized than considerations of efficiency might dictate. The conditions of civilized life are highly artificialized, and our routines commonly take us about safely enough within the rather narrow limits of our place and station. There is every reason for agreeing with Boas that man is himself a domesticated animal:⁶

Most of the races of the present day are anatomically in the same condition as those types of domesticated animals which are highly modified by regular feeding and by disuse of a considerable portion of the muscular system, without, however, having been subjected to any considerable artificial selection.

In this respect we are like the cat who warms himself upon the hearth. His ancestors once roamed wild in the tangled forest, the enemies of all and the friends of none, earning their right to live from moment to moment by stealth, alertness, and cunning. The house cat apparently retains only

the barest reminiscences of this feral spirit, and has developed in its stead a fairly high degree of tolerance for domesticity. So too with us; as Graham Wallas has said, "we have become biologically parasitic upon our social heritage,"⁷ until we not only prefer the sort of life it offers, but are accustomed to interpret the whole of experience in the terms of its categories, and are scarcely able to think of any others. Just as the domesticated cat depends upon an artificial order of relations outside himself, so do we in our thinking rely—and gladly—upon the schemas of our group. The genuine difficulty of inventing new forms for the structuring of thinking is usually enough to discourage the inventive endeavors of any of us who are dissatisfied with the idea of adopting at second hand the materials and the structures of thought.

(3) *The strength of habit.* The emotional uniformities and intellectual stereotypes we have already discussed are of course habits. But many of our routines are more easily approached from the motor side, since they enter only indirectly at best into awareness. We all of us exhibit bodily postures and little muscular tricks that have become characteristic of us. Almost nothing is known in detail concerning the processes by which habits are formed, although psychologists have speculated freely regarding the behavior of neurones during the process, and numerous efforts have been made to state the laws of learning. Recent analytic work on the solution of mazes, both by human beings and by animals, and on the conditioned reflex, promises a rich harvest for the understanding of the problem in the near future.

The way in which habit mechanizes response can be illustrated by considering what occurs when one learns to type-write by the touch method. The student seats himself before the machine, and is instructed to place his fingers on certain keys, while keeping his eyes fixed either on the material to be copied or on a diagram of the keyboard of the typewriter which is hung across the front of the room. He begins the first exercise, making each movement very clumsily and in a highly tentative and halt-

ing fashion. There is a pause after each stroke; the impulse to hit the wrong key is strong; and the student cannot avoid casting a glance now and then at his hands. The process is extremely fatiguing, the whole body being to some extent drawn into the making of every stroke, and muscle pulling against muscle. Attention is severely concentrated. The student is, no doubt, disappointed by his poor showing.

If after some months of practice the same student be watched once more, an entirely different picture is presented. His fingers now fly rapidly over the keys as he turns out line after line of copy, and he is so little engrossed by the task that he is able to talk to a friend and glance around the room as he types. He may even be able to compose a more or less complicated essay directly on the machine, and we find that his ideas flow out through the mechanism quite as easily as they would through a pencil or pen. The keyboard which it was so much trouble to learn has practically dropped from his mind, and if he were suddenly asked where a certain letter is situated and with what finger it is struck, he might have trouble in telling, though he can strike it without difficulty when required. The whole process has become almost automatic.

What happened during the formation of this habit? First and foremost, movements were simplified and abbreviated. Many superfluous side responses disappeared, or were woven integrally into the activity, and the movements still necessary are made in a clean-cut, authoritative manner, with a minimum of diffuse activity. In addition more things are being done at once, for tasks previously performed separately are now merged into a unified whole. At the beginning, the striking of each letter was an independent act, or even a series of acts; the letter had to be noted, the place of the appropriate key recalled, the finger tentatively shifted until it rested on the key, the key pressed down, and the result observed with disappointment or relief. Now, however, whole sentences are struck off by what appears to be a single operation. This is sometimes called the formation of higher units; it is now less trouble to run off a complicated

movement sequence than it once was to strike a single key correctly. The initially separate processes are drawn together to form a unified series of movements. In addition the work is no longer exhausting. The muscles perform their functions without conscious constraint or direction, and the activities engaged in no longer demand close attention. Interest either wanders or becomes attached to the perfection of details the very existence of which was not suspected at the beginning of the learning process. The output of work is better and larger, and its amount and accuracy are more constant; and all this takes place at less psychic cost, except as the task becomes monotonous and boring.

The whole series of operations seems to have been taken over by the muscles. In a highly formed habit they mount to undisputed leadership, so that the process would be brought to an immediate halt if consciousness ventured to interfere for a single moment. The accomplished pianist who is negotiating a difficult run can little afford to puzzle out its intricacies in the midst of a recital. If he is playing from memory, the muscles of the fingers and arms must themselves do the remembering; if he has the music before him, the most direct connections possible between the eyes and the hands must have been established; if he is reading from sight, previous training must through painstaking habituation have prepared the appropriate nervous pathways for the task. Our habits therefore represent perhaps the strongest psychological forces working towards routinization. Habit does more than standardize our responses. Through habit we become accustomed to greater degrees of uniformity in our behavior patterns, thanks to the effect of group expectations in stabilizing our actions, than we should ever ourselves be likely to require. We encourage children to form habits of steadiness, reliability, initiative, and self-control that they would never think of forming if they were left to themselves. Once these habits are formed, however, they may become necessary to the happiness of the organism, and may even in their turn function more or less independently toward the development of still other routines.

Psychologists have made it one of their habits to discuss the great stability and automaticity of our habits; but they have generally neglected to point out that the invariability of our behavior patterns depends quite as much on fixed social routines as on fixed organic dispositions. Rip Van Winkle remains a toper not only because past drinking has polarized his organism towards alcohol, but also because the normal routines of his group are such as to make drinking easy and refusing to drink hard. His system would not now crave alcohol if he had not been led by his cronies to spend his days and nights at the tavern, where acquisition of a taste for strong drink was all but inevitable. Few stimuli are potent enough to lead to the formation of highly stereotyped habits if they are not supported by well-established group routines.

(4) *Vested interests and the existing routines.* Any established way of doing things will, in proportion to its importance, require functionaries to keep it going, and will yield special honors and perquisites to a selected few. Vested or intrenched interests of this kind with practically no exceptions will be opposed to any change which would dispossess them. Persons enjoying a vested interest need by no means be the recipients of graft; they may in fact be hardworking and underpaid, and may be performing valuable social services. But since they usually stand united against any thoroughgoing change in their status, the existence of vested interests is one of the factors tending to keep things as they are.

It is possible to maintain a vested interest in an idea or theory, or even in a set of facts. Among some primitive peoples the privilege of telling a certain story is a strict property right which is open to sale or exchange under the conditions which govern the disposition of other pieces of property. Our copyright laws establish virtually the same arrangement for a limited term of years. But a man may even feel a vested ownership in a theory which he has enunciated, and be loath to give it up long after the facts have shown themselves to be against it. It is then that the winds of dialectic are most frequently unloosed.

Social forces upholding routines

(1) *Tradition.* The mass of culture tends to perpetuate itself by virtue of its magnitude, interdependence, and inertia. It is seldom questioned since it involves a compact and well rounded view of things that can to some extent be supplemented or extended, or perhaps even be corrected in minor details, but in the end must stand or fall as a unit. Its different parts are so intricately intertwined and connected that little or nothing can be done towards their separation. A man might conceivably take the culture scheme or leave it, but if he tried to take part of it and leave the rest, the task of separation would not be an easy one.

The growth of tradition, that is, the accumulation of knowledge, ideas, beliefs, standards and values, has gradually substituted a psychic environment for an environment of real objects. This does not mean that civilized man has a smaller world of real objects, but only a larger world of ideas; and that he approaches his world of real objects with certain values which he has gotten from the social tradition behind him.⁸

An example may help to establish this point more clearly. Modern historians have accumulated a great deal of knowledge about the past, which they interpret in the terms peculiar to our culture, such as democracy, development, nationalism. Now suppose one of us were eager to study history, but desired to see each period not with the eyes of the present, but somewhat as it appeared to a contemporary. The task would be difficult, since the materials needed for the synthesis would not be available, or would be hidden away in obscure sources. A man might believe, for example, that the peasants were more important in effecting the French Revolution than historians commonly suppose. How shall he determine whether his hypothesis is sound? The histories and the sources are full of evidence tending to show that the middle class, or the nobles, or the city proletariat, or the intellectuals, were especially active in bringing about and consummating the Revolution, while references to the peasants are incidental or trivial. This may be because they were actually relatively inactive; or because, although they

were importantly active, their activity has left relatively few traces; or because few historians have been interested in the part they played. The prevailing conceptions of the historians might here be preventing them from satisfactorily understanding a great event. If this were the case, it would be easier to invent history than to rewrite it, but it would be easier still to take over the history that had already been written. If a group of persons so interested in attaining impartiality as the historians carry over into their writings their own interests and viewpoint—that is to say, their accustomed set of mind—we are not surprised to find more uncritical folk reading their own mental surroundings and habits into their interpretations, and following in their behavior well-established because time-honored social patterns.

(2) *Indoctrination of the young in the course of education.* A large proportion of the members of nearly every society are immature children who, though social by nature and dependent upon others for everything they have, are in the beginning absolutely ignorant of the ways of life of the particular group into which they have been born. Everything they are ever to know and feel about these behaviors must be learned, and therefore one of the chief functions of the group is the communication of its characteristic behaviors and attitudes. The term *education* may be used to indicate all phases of the process by which the body of tradition is transmitted from one generation to the next.

The formal education offered in the schools is of minor importance in comparison with the informal training to be gained inside the family circle and in other face-to-face associations. The latter kind of education takes place, as it were, by osmosis or seepage, and gives a bent to the mind of many a child who remains almost unaffected by all direct attempts at training. The school can teach a child how to read and write, but whether he will have real interests that can be satisfied only by good literature, and what he will write, usually depend on influences radiating from the home and from his more immediate circle of associates. Similarly, the school can preach the desirability of high moral standards, but to little or no effect if the child's parents and friends

do not in their lives support the preachments. This in some ways is discouraging, since institutions like the home and neighborhood groups are not strikingly amenable to external improvement; but it must also be admitted that society is held together by these primary groups. They furnish an indispensable basis for the development of the ideal of social solidarity.

Home is the place where, when you have to go there,
They have to take you in.⁹

Other social relations are more precariously established when the training in social unity offered by primary groups has been denied. In addition the major part of our deepest and most valuable experiences develops out of these associations.

A large part of all education, formal and informal, is devoted to indoctrination, while but little time and attention are given to a freeing of the mind. With little children no more ambitious program may be possible, since they must first really *have* minds before their minds can be free, and for that *some* knowledge, true or false, and *some* modes of action, good or bad, are necessary. But it certainly seems that colleges and universities might devote more effort and thought to the attainment of mental liberation. The problem is by no means a simple one, and we must remember that, though it is certainly worth having, few people would know what to do with freedom. The Erewhonians were accustomed to address the following adjuration to their children before permitting them to be born:¹⁰

Remember also, that if you go into the world you will have free will; that you will be obliged to have it; that there is no escaping it; that you will be fettered to it during your whole life, and must on every occasion do that which on the whole seems best to you at any given time, no matter whether you are right or wrong in choosing it.

Social functions of routine

Some degree of routination is absolutely necessary for the saving of time and energy, as can be seen by comparing the

ease with which an adult dresses with the slow and bungling movements of the child. The day would be over before we were ready for it, if it were not for our habits. Patients afflicted with aboulia offer pathetic confirmation of this fact. They may be unable to make even the simplest decisions without a fierce internal struggle which leaves them quite exhausted. "Shall I wear my coat, or shall I not?" may be the question which such an individual has to decide, but the reasons pro and con are so convincing that they cancel each other out, leaving the poor fellow with absolutely nothing to do. It is fortunate that for most of us all the simple acts of life have been settled beforehand by habits based upon the routines of our group. Stereotyped actions are easily enslaving, but for a really free mind it is nevertheless necessary to form many habits. If we are to think seriously about some things we cannot waste time over others, but must deliver them over to the care either of other persons or of habit.

Routines stabilize action—they make the responses both of individuals and of groups more invariable, and therefore more predictable. A concert manager in planning his concerts can definitely assume that a certain proportion of his audiences will arrive late, and a certain proportion leave early, no matter when the concert begins or ends. The matter is summed up in the observation that no single Congressman is as big a fool as Congress can be. We are continually acting on the principle that in the long run life will grind out so much of this and so much of that, and in the human sphere the existence of routines is one of the chief reasons why it is safe to follow this principle.

Routines generalize our responses by leading us to deal with the individuals whom we meet according to the canons of age, sex, caste, locality, relationship, wealth, or other classifications. Consider, for example, the officers of religious organizations. A certain type of behavior, varying somewhat from denomination to denomination, is regarded as appropriate for religious functionaries, and it is surprising how closely the members of these groups finally come to resemble each other. Thus life routines have the effect of

reducing the differences between members of the same group, and of widening the gaps between different groups. Frenchmen and Americans are more nearly alike at birth than they are as developed individuals. As adults they have become accustomed to different modes of life and different ways of interpreting their experiences, and in spite of their personal idiosyncrasies it is seldom difficult to determine to which group given individuals belong. There are few of us who do not feel a real pleasure in being like the other members of some group—or, as one young fellow once expressed it, “Why not be original and do as the others do?”

The trend of routines is therefore towards superficiality and social inertia. It is difficult enough for a single individual to get rid of a habit when he really wants to, but it is a thousand times harder to change the settled ways of acting of a group of persons when they haven't the least desire for something new. “That isn't the way we do it” is often the only answer given to a suggestion involving novel modes of action. In addition, cultural elements usually interpenetrate to such a degree that a change in one situation would involve changes in many others, and the game is seldom thought to be worth the candle. As a result we observe the phenomenon of the *cultural lag*, or the latent period when forces making for change are present in the social order but are seemingly impotent.¹¹ This latent period may last from a very short time up to many centuries, as may be seen by comparing the rapid manner in which the radio was recently introduced with the long history of the antislavery movement.

Most of our routines represent adjustments rather to past conditions than to the way things are actually functioning at the present moment. It is fascinating to realize that the world in which we live is really a great historical museum in which are preserved all manner of ideas, customs, traditions, beliefs, and institutions. Even today many people to all intents and purposes are still living in the stone age, and if a census were taken of the contents of men's minds it would be safe to wager, in the case even of brilliant and independent thinkers, that a large proportion of their ideas are of

extremely ancient origin. Even when the basic conditions of life are in rapid flux, as in a frontier community or on the battlefield, the old routines may persist to retard much needed adaptations to the new situations.

Yet when all is said and done a good word may still be put in for routine as the chief social conservator. Intelligence and innovation are after all far too fragile instruments to be entrusted with the task of holding society together. What is required are not the subtle principles of affinity that sometimes bind single individuals to each other, but gross and general forces which can act on and through all men, whether they will or no; and among such forces routine is by no means the least significant. Then too, although its binding threads do hold us tightly in our places, they are seldom felt as chains, and whenever they are cut we at once start replacing them with others.

REFERENCES

¹ Havelock Ellis, *The Dance of Life* (Boston, Houghton Mifflin, 1923).

² See Josephine Goldmark, *Fatigue and Efficiency, A study in industry* (3 ed., N. Y., Russell Sage Foundation, 1919), 43-53; based largely on *Report of the Royal Commission on a Dispute Respecting Hours of Employment between the Bell Telephone Company of Canada, Ltd., and Operators at Toronto* (Ottawa, 1907), and *Investigation of Telephone Companies made by the U. S. Bureau of Labor* (Senate Doc. No. 380, 61 Congress, 2 Session, Washington, 1910).

³ Charles H. Judd, *The Psychology of Social Institutions* (N. Y., Macmillan, 1926), 105-128; the quotation is from pages 105-106.

⁴ Jonathan Swift, *Travels into Several Remote Nations of the World* (London, 1726), Part I, Chapter 2.

⁵ Cf. Hamlet's soliloquy, Act 3, Scene 1.

⁶ Franz Boas, *Anthropology* (N. Y., Columbia Univ. Press, 1908), 11.

⁷ Graham Wallas, *Our Social Heritage* (New Haven, Yale Univ. Press, 1921), 17.

⁸ Charles A. Ellwood, *Introduction to Social Psychology* (N. Y., Appleton, 1917),

130.

⁹ Robert Frost, *The Death of the Hired Man*.

¹⁰ Samuel Butler, *Erewhon, or Over the range* (N. Y., Dutton, 1920; 1 ed., 1872),

194.

¹¹ Cf. W. F. Ogburn, *Social Change, with respect to culture and original nature* (N. Y., Huebsch, 1922).

Chapter X

TOOLS AND MACHINES

What tools are

A tool is a device employed to facilitate the application of mechanical power. The simplest tools are unshaped natural objects used to direct or control the release of muscular force, as when a man hurls a stone at an attacking dog, or thrusts out a stick to keep himself from falling. In such cases the object is utilized as it exists in the order of nature, nothing being done to work it over into a more effective form. Animals often use objects as tools to the construction of which they have contributed nothing, as when a monkey beats his companion with a club, or climbs onto a box to reach a banana suspended from the ceiling of his cage. In this elementary sense few objects escape being tools.

But natural objects are also made over so that they may be more effectively utilized. Köhler has shown that monkeys are capable of making simple tools. They can fit two sticks together to form a longer stick with which to reach a banana lying outside their cage, or they can make a ladder by piling packing boxes on each other so as to reach fruit which has been suspended high above their heads. Such acts, and many others described by Köhler in his work entitled *The Mentality of Apes*, require no little intelligence, and cannot fail to increase one's respect for these near-humans.¹ Whether other animals are in the habit of manufacturing tools is not so clearly established, except possibly in the case of the social insects as the bees and ants.

One of the most important sources for an understanding of prehistoric man is the large variety of tools, such as clipped flints, smoothed stones, and shaped bones, which have been found in and about the places where he lived. These exist in many different styles and forms, and of widely varying workmanship. With the limited facilities available to prim-

itive man, considerable ingenuity, skill, knowledge, and muscular control had to be coördinated in one series of operations to chip out an arrow head or a moderately good cutting edge. The manufacture of even these early artifacts was possible only through the use of yet other tools. Thus in making an arrow head, at least two implements are required—a stone to deal the blow, and a blunt pointed object to localize its effects; and the force must be applied at just the right angle and with just the right strength, or the job will be spoiled.

Tools as foci of human activity

Tools furnish excellent objective examples of the interaction and interdependence of individuals, the physical environment, and the social heritage. Every manufactured tool concretely embodies a social heritage of accumulated knowledge, requires a technique of use with its accompanying qualities of personal skill, and indicates or implies a body of materials upon which the tool is to be used. We shall discuss these topics in order.

(1) *Tools and the social heritage.* No tool is ever more than an improvement or adaptation of an already existing device. This is beautifully shown in the case of Watt's first noteworthy advance on the steam engine as developed by Newcomen. In Newcomen's engine the steam was condensed within the piston cylinder by a jet of cold water after it had pushed the piston up to the other end of the cylinder. This device, which Newcomen had hit upon by the accidental leakage of water through a piston being run under other conditions,² required that the piston cylinder be alternately heated and cooled—heated, that is to say, by the steam and cooled by the jet of water—and was therefore thermally inefficient. Watt decided to provide an extra chamber for the condensation of the steam, so that it could expand in the cylinder and thus drive the piston, and then be removed elsewhere to be condensed. As he himself tells it,³

I had gone to take a walk on a fine Sabbath afternoon. I had entered the Green by the gate at the foot of Charlotte

Street and had passed the old washing-house. I was thinking upon the engine at the time and had gone so far as the herd's house when the idea came into my mind that as steam was an elastic body it would rush into a vacuum, and if a communication were made between the cylinder and an exhausted vessel, it would rush into it, and might be there condensed without cooling the cylinder. . . . I had not walked further than the golf-house when the whole thing was arranged in my mind.

Watt's greatest invention, which consisted in the idea of introducing the steam alternately on each side of the piston, instead of on one side only, as in all former engines, while undoubtedly a stroke of genius, nevertheless in principle involved only minor alterations of the existing mechanism.

Striking examples of the dependence of new items upon already existing cultural elements can be seen in the early locomotive and railroad coach and in the automobile, which were modeled in their first phases upon the stagecoach and the horse drawn carriage. Only with the passing of time were new forms more appropriate to their own particular functions developed for these devices. The existing locomotive, passenger coach, or automobile is a great congeries of hundreds of inventions, and is, of course, also dependent on hundreds of other improvements which have by now been superseded. In 1857 it was said that the spinning machinery then in use was a compound of about 800 inventions, and most if not all of these inventions were no doubt based on many other improvements and adaptations.⁴

(2) *Tools and the individual.* The tool also furnishes evidence of the continuous efficacy of individual action in social life. Not only are practically all tools individual creations; the mere use of a tool requires acquaintance with and some degree of mastery over a specific technique. This technique is itself no doubt almost entirely socially inherited, and seldom could be reproduced *de novo* by the tool-user were it to be lost, but he must be competent to apply it with at least passable skill to the varying peculiarities of concrete tasks. The situation alters seriously with the passing of the hand tool in favor of the machine, as we shall see, but so long as the workman is called upon to use tools

his work requires from him coördinations of mind and of muscle, and the materials resist the working out of his purposes. This cannot but be developmental of his personality and character.

(3) *Tools and the materials on which they are used.* Every tool while being used presupposes and requires a fairly intimate contact with certain natural materials. It is generally not difficult to know when these materials have been spoiled, and good workmanship also can usually be identified, so that fairly objective standards by which to judge one's work are continuously available. And these standards are to some degree (though by no means absolutely) impersonal, in that the output can, to a point, be compared with the possibilities of the situation, rather than with extrinsic subjective considerations. For good work, the proper instrument must be applied to the right materials in the most effective manner; and it is usually possible to determine the presence of bad work by an examination either of the product or of the instrument that was used.

The effect of tools upon thinking

This leads naturally to a discussion of the effect of tools upon the life of thought. Every tool indicates a means, or a series of means, whereby some natural object can be shaped to some human end. That is to say, tools embody and objectify relations. They establish a concrete relation between the tool-user, the tool, and his materials, and a relation, too, upon which attention must be focussed during the activity of use. Here I am, for example, with a knife and a piece of wood and a few minutes to spend whittling. When the knife is applied to the wood a large number of different things, some of them in the knife, some in the wood, and some in me, are brought together into an extremely intimate relationship and jointly act to determine the nature of the resultant cut. What of the blade—is it sharp, long, thin, light, well-socketed in the handle? What of the wood—is it soft, close-grained, free from knots and from a tendency to split? What of me—how do I wield a knife, what notions relevant to the task run through my mind as I sit here whit-

ting? A synthesis of all these factors, and of many more too numerous to mention, is achieved right before my eyes in the different cuts made in the stick.

Relations are extremely important in our lives, for thought very largely subsists on them. Imagination, for instance, might be described as the power to view objects in new and significant relations. Now, while the use of an object as a tool within the strict meaning of our definition ("a device employed to facilitate the application of mechanical power") is certainly not necessary in every instance where relations are perceived, the pattern of the tool situation is characteristic of many thought situations. Just as a heavy stone may be shifted through the use of a handy stick as a lever and another stone as a fulcrum, so an intellectual problem may be solved through the mediation of an idea which relates it to other things already known and under control. The user of tools may be expected to demand of his mental constructs the same objectivity and relevance he is in the habit of expecting from his physical constructs. He will not be content (to make use of a vivid phrase coined by an engineer) to depend upon sky-hooks in his thinking. The man who has had little experience with tools, on the other hand, is likely to find his thinking somewhat naïve and lacking in balance. Tools therefore affect thinking in at least two directions—by making it vividly real at the points where the use of tools (or their genuine ideational equivalents) has laid objective relations open to our eyes, and by making it cautious and reserved elsewhere.

It is enlightening to look at thinking itself from the instrumental point of view—with respect, that is to say, to the functions it performs in our lives. Thinking may be regarded as one of the ways of maintaining organic equilibrium. From this standpoint ideas really function in two different though related contexts, for on the one hand they are connected with items in the environment, while on the other they are associated with a complex of organic processes. Neither the external nor the internal reference of our thoughts need have anything to do with the implications one might legitimately draw from them according to the

canons of pure logic. Just as the remark, "Isn't it a pleasant day?" need have no meteorological reference, and indeed, may have no significance whatever when taken out of its context, but may merely be part of a conventional interchange of amenities, or perhaps a bid for a conversation on the part of a lonely person; so the real import of our thinking is not abstract, but is to be sought in its external context—in the natural situation out of which it arose—and in its internal context—in the subjective conditions which gave it birth. We cannot hope to understand a man's idea of God or of anything else if we approach it in abstraction from its historical and its biographical connections. This is why strange faiths so often seem artificial; they draw their life blood from another culture stream than our own, and they feed different natures, so it is not surprising if they appear unintelligible. For an idea to be intelligible, it must operate in a familiar context, be relevant to other items in experience, fulfill some expected function either in the external economy of things and persons or in the internal economy of feelings and thoughts. An idea is an idea by virtue of its being in a functional relationship to other things, just as a tool is a tool because it facilitates the application of mechanical power.

Tools as liberators of human energy

The tools which human beings have invented very greatly extend man's power over nature. Some of his organs, as for instance the hand, are themselves quasi-tools, but by invention he has to all intents and purposes gained additional organs, while at the same time he has increased the dexterity of his natural parts by submitting them to the discipline of tools. The effects of this training can be seen by comparing an adult's hand with a baby's, or with an adult's foot. In the beginning the baby can do but few things with his hands—he can grasp a small bar and support his full weight by one arm, he can open and close his hands, spread the fingers, and move them about (the thumb usually remaining folded inside the palm until about the 100th day), and he can put his fingers in his mouth; but this is about all. His

repertoire of foot movements is hardly less wide, but we keep the feet covered and the hands exposed, and expect the hands to take part in countless activities, many of them requiring the use of tools, so that in the adult the feet have become well-nigh useless except as stumps to stand on, whereas the hands are seldom inactive during our waking hours. The hand may be potentially a better instrument than the foot, but the varied functions performed by the feet among many primitive peoples are enough to indicate that their present low estate is in part due to lack of opportunity for development through the use of tools.

Tools thus act directly on the human organism to mold its contours and its powers; but they also require us materially to change our behavior patterns by altering the world we live in. This alteration takes two forms. Tools change the proportions in which old things appear in our environment, and they also introduce new elements into it. A man with an ax will search for entirely different kinds of fuel than will the person who lacks this tool. The latter will have to be content with what he can pick up and break up with his hands, whereas the former can choose between these pieces and much larger growths. Similarly after the invention of the typewriter it became possible to choose whether a letter shall be written by hand or on the machine. Writing by hand did not completely disappear, and the amount of writing going on within the group greatly increased, so that many changes in the existing arrangements were necessitated. The old amanuensis disappears and is replaced by the typist; business comes to depend more and more on continuity of communication; increasingly great, supplies of paper, carbons, typewriter ribbons, desks, etc., are required; an impetus is given to the making of related discoveries and inventions; literary styles are affected, not only as respects business communications, but wherever writing goes on; etc. Thus the invention of the typewriter, instead of lightening the labor of writing in our culture, may very conceivably have increased the amount of time and effort spent on this function, and at any rate has greatly changed our manner of living.

Any person who has ever had occasion to use a hammer or a screw-driver or a saw will recognize how markedly such simple tools economize human energy and enable human purposes to be realized. Though we must look to nature for everything we have, few things occur there in precisely the most usable forms, and so they must be worked over or shaped before they can be enjoyed. For the performance of these functions our natural organs are often inadequate except when they are supplemented by tools. No culture ever fails to include a fairly large number of contrivances, many of surprising ingenuity and effectiveness, for accomplishing the tasks laid upon its members.

The machine

A machine is an arrangement of resistant bodies whose motions with respect to each other are constrained in such a way as to lead to the transformation of natural energies into some form of work. Our world is dynamic at every point, but many of its energies in their natural forms are not directly available for controlled human uses. Thus the heat energy radiated from the sun during the course of a summer's day is tremendous—according to one estimate the earth absorbs heat energy from the sun at a rate of over 162 trillion horsepower—but no practical means has as yet been devised for concentrating and controlling this immense reservoir of power. Again, great stores of energy were locked up in coal and other combustibles until men invented devices by which the release of this power might be canalized and directed. Our primitive ancestors who treasured and maintained the fire which they chanced to discover burning in a lightning-struck tree after a storm, and who thereafter used this fire to warm themselves and to cook their food, had not invented a machine, though they were making use of a natural energy, for the motions involved followed no strictly predetermined paths. But when heat was used to drive a steam engine the case was different, since the device is so arranged that a piston is driven back and forth, and this piston in turn moves other parts of the apparatus, each part traveling along fixed paths and repeating over and over again

the same cycle of motions. Some parts of the machine slide back and forth, others rotate, and yet others go through more complex motions, but the position of every part at any given moment is determined in relation to the positions of all other parts.

Some machines are exceedingly simple, as for instance, the lever, which consists of a rod or bar turning upon a fixed point or fulcrum. A good strong stick with a rock for a fulcrum will make a perfectly satisfactory lever which can be used to move large stones. The first machines were therefore no doubt unaltered natural objects, as were the first tools, although most machines in use today are fairly complex and are manufactured with the help of tools and other machines.

The development of our machine civilization

The western world has been entirely transformed within the last two hundred years by great changes in the mechanical apparatus of life. These changes, which are collectively known as the Industrial Revolution, and which are not as yet completed, from the engineering point of view have three foci: the metals, and especially iron and steel, have assumed a more important position in our culture than they ever held before; skill has been transferred from the worker to the machine; and new power resources have been opened to general industrial use. The analyses that follow will serve to indicate the extreme recency of the more important developments in each of these fields.

(1) *The development of effective methods for purifying iron.*⁵ Iron ores (usually oxides of iron) occur abundantly in nature, and primitive Old World peoples appear to have been so universally acquainted with the metal that the earlier anthropologists used to speak of an Iron Age. Until very recently, however, no economical method was known of freeing the metal from its major impurities, carbon in particular remaining in such fairly large quantities as materially to change the character of the product. Three kinds of iron are commonly recognized: cast iron (or pig iron), which contains a large amount of carbon (up to say 5 per cent) and is brittle

and unmalleable; wrought iron, from which carbon is absent, or present only in trace, and which is soft, tough, and fibrous; and steel, which contains small amounts of carbon (up to say 1.5 per cent), and is malleable and hard. It is not difficult to obtain cast iron either by primitive methods or through the use of the blast furnace (which is thought to have originated in the Rhine provinces in the 14th century). In the blast furnace the iron ore is heated in the presence of a blast of air after the addition of limestone to oxidize the ore. Before the eighteenth century wrought iron (iron free from carbon) was obtained from cast iron by heating the cast iron with charcoal, a pure fuel of this type being required because the iron and the charcoal were placed in the same receptacle; while steel (called blister steel) was made through a long and extremely expensive process involving the heating of wrought iron in the presence of carbon. As may be imagined, this blister steel was seldom of the same quality throughout; but in 1740 Robert Huntsman of Sheffield began to obtain a homogeneous product (called crucible steel) by remelting the blister product in small crucibles holding about 20 pounds per charge. His steel was used in manufacturing edge tools, cutlery, dies, and drills. Although Huntsman's method of obtaining good steel has been compared in importance to Watt's perfecting of Newcomen's steam engine, it was very costly—iron ore was changed into cast iron in the blast furnace, the cast iron into wrought iron in a charcoal hearth, the wrought iron into blister steel by reheating in the presence of carbon, and finally the blister steel into Huntsman's crucible steel by remelting, much fuel and time being required for each stage of the process.

In 1784 Henry Cort invented the dry puddling process for obtaining wrought iron from cast iron, using for his method the reverberatory furnace, in which the metal and the fuel are kept separate, the flame beating down from above onto the metal. This permitted the charge being decarbonized into wrought iron to be raised from about 100 pounds to as high as 500 pounds, and made it possible to use coal instead of charcoal as a fuel. In 1828 Neilson improved the technique of extracting cast iron itself from the ore by heating

the air blast before it was introduced into the furnace, and a little later Siemens devised a method of using the waste products of combustion for the purpose of heating the blast. By Neilson's invention, when the blast was heated to 300° F., 5 tons of fuel were needed to produce one ton of product, as against 8 before; while but 2¼ tons were required when the blast was heated to 600° F. As a result of the consequent reduced cost of manufacture, Scotland's production of cast iron increased five-fold between 1830 and 1840.

But the development that above all others has made the twentieth century an age of steel is commonly credited to Henry Bessemer, who in 1856 came upon a cheap method of making low-carbon steel by blowing air up through the molten cast iron as it rests in the reverberatory furnace. It is interesting to quote his own statement telling how he made his discovery:⁶

Some pieces of pig iron on one side of the furnace attracted my attention by remaining unmelted in the great heat of the furnace, and I turned on a little more air through the fire-bridge [*i.e.*, blast air] with the intention of increasing the combustion. On again opening the furnace door, after an interval of half an hour, these two pieces of pig iron still remained unfused. I then took an iron bar with the intention of pushing them into the bath when I discovered that they were merely thin shells of decarburized iron showing that atmospheric air alone was capable of wholly decarburizing gray pig iron and converting it into malleable iron [wrought iron] without puddling or any other manipulation. Thus another direction was given to my thoughts, and after due deliberation I became convinced that if air could be brought into contact with a sufficiently extensive surface of molten crude iron it would be rapidly converted into malleable iron.

He found that the combustion of the carbon contained in the cast iron was itself sufficient to keep the contents of the converter liquid during the ten or twelve minutes required by the process. This invention, which was independently arrived at by William Kelly in this country some eight or nine years before Bessemer,⁷ has completely revolutionized modern life. Before Bessemer's time steel was too expensive

to be used in large pieces, and only such objects as watch springs, tools, utensils, dies, and other small objects were made from it, wrought iron being employed for rails and structural work, although it was unequal to the purpose. The first Bessemer rails had a life of six years at a spot where the iron rails they replaced had lasted for only three months. Neither modern railroading nor modern building operations were possible under the conditions obtaining prior to Bessemer's invention.

Space is available for the mention of but two other improvements in the process of obtaining steel. First is the development of the open hearth or Siemens-Martin process, successfully established by 1868, which uses gas (heated before it enters the combustion chamber to over 1,000° F. by the waste gases of the furnace) for melting down the raw materials, and which yields a finer and more uniform product than the Bessemer process. As things now stand Bessemer steel is used for rails, girders, beams, etc., open hearth steel for steam boilers, armor plate, etc., and crucible steel for fine tools and cutlery. The second development was the discovery of processes for the manufacture of extraordinarily hard steels. To harden or temper ordinary steel, it is heated to a high temperature and then suddenly cooled in water or some other medium; but Robert Mushet in 1868 noted that one of his heated bars had become hard without the customary quenching. He analyzed the metal, and found that it contained tungsten as well as manganese and carbon. So the matter rested until 1900 when the Bethlehem Steel Company exhibited at the Paris Exposition a specially tempered steel obtained by F. W. Taylor and M. White which contained chromium as well as the other elements of Mushet steel. This steel showed great hardness, and was capable of cutting ordinary steel castings at the rate of 2½ feet per second at much higher temperatures than ordinary tools. The discovery of these high-speed steels has entirely changed the conditions under which modern machinery is made, as will be shown in the next section.

(2) *The transfer of skill to the machine.*⁸ This story, although it is the essence of all phases of the Industrial

Revolution, will be told here in connection with the development of *machine tools*—of machines, that is to say, which work up blank pieces of metal into shapes to be used in making other machines. The world was well acquainted with both tools and machines before the eighteenth century, but up to that time most instruments were so constructed that they could be handled effectively only by skilled workmen, whereas Hargreaves by inventing the spinning-jenny (1770) made it possible for almost anyone to spin thread. The earlier workmen kept their tools and machines in their own homes, and were therefore the masters, whereas workmen under the factory system do their work in the places where the machines are kept, and the machines therefore become their masters.

James Watt found himself greatly hindered in the development of his steam engine because the machinists of his day were unable to bore a cylinder which would keep the piston snug against the cylinder wall throughout its back-and-forward motion. The first modern machine tool was Wilkinson's boring machine (1775), which made it certain that Watt's invention would be a commercial success.

We find Messrs. Boulton and Watt writing in 1776 to The Carron Company: "Mr. Wilkinson has bored us several cylinders almost without error; that of 50 inches in diameter which we put up at Tipton does not err the thickness of an old shilling in any part." . . . Now it is possible without trouble to bore a cylinder 10 feet in diameter with a variation in diameter of less than one-hundredth of an inch, and much greater accuracy can be obtained if necessary.⁹

The real foundation of all modern machine tools, however, was laid by Maudslay's slide-rest for the lathe (*ca.* 1800). in the next fifty years most of the basic types of modern metal-working tools were stabilized. The lathe is found among many cultures in different parts of the world, and consists essentially of a device whereby the materials to be worked can be rotated while they are being shaped. In the simpler lathes the rotary motion is given by the hand or the foot, and the shaping tool is held by the hand against the

object which is being shaped, the skill and touch of the workman determining the success of the operation. Maudslay by providing a rest for the working tool made the operation semi-automatic. From this point the development advances along two somewhat connected lines. The machine tools become increasingly self-controlled and more and more they are operated by extrahuman sources of power. The former process renders thought and skill less necessary to the machine workman, while the latter minimizes the importance of his muscular powers. Only the development towards automaticity will be traced in this section, while the applications of extrahuman power are discussed in the section that follows.

In the two generations following Maudslay, Joseph Whitworth dominated the machine tool situation. He it was who in 1841 standardized screw threads; and he also developed the planing machine to so high a state of perfection that surfaces planed on his machine when placed on top of each other would adhere until pried apart, so close was their contact. He did much to establish the accuracy which is such an essential part of modern machine tool practice.

The next important move was made in the United States, where the fire-arms manufacturers of New England were already familiar with advanced techniques. Indeed, as early as 1798 Eli Whitney employed the interchangeable system of manufacture in connection with an order for 10,000 muskets. The first contract specifying interchangeability was signed in 1813 by Simeon North, and stated:¹⁰

the component parts of pistols are to correspond so exactly that any limb of one pistol may be fitted to any other pistol of the 20,000.

The great invention, however, which rendered machine tools fully automatic for many operations, was the turret lathe, which appeared in the 50's, and was improved in the period following the Civil War. On this lathe the cutting tools are held securely in place by a "turret" or holder, which can be turned from one position to the next as each tool finishes its particular job of cutting. Among the improvements was a

device whereby the turret was automatically turned at the appropriate moments so as to bring a new tool into play. After the adoption of this invention the workman's task, when once the tools were set by an expert mechanic, was merely that of putting blanks into the machine, turning on the power, and waiting until the finished part was completely shaped and ready to be replaced by another blank.

With the development of extraordinarily hard high-speed steels since 1900, conditions again changed. For years the ability of the cutting edge to keep its temper under the frictional heat of cutting had been the limiting factor in the whole process; whereas now the ability of the mechanism to give the power or the rigidity which the new steels are capable of using sets the upper limit to the work that can be done. High-speed cutting in many instances is marvelously efficient; thus in a certain instance where eight large bolts could be produced in a day under former conditions (when they were first rough-forged and then cut by the machine), with the new cutting tools forty bolts could be made directly from the bar, and the cost of making a bolt was one-twelfth of the previous cost.¹¹

An unskilled workman operating a machine tool today can turn out many times the product of a highly skilled operator working under the conditions obtaining two or three generations ago, and at a fraction of the former cost; while the automatically manufactured pieces are more perfect than those which the skilled workman would produce. The term "unskilled" as here used must be taken at its full meaning—in the Ford works, for example, 46 per cent of the jobs require only one day's training, 36 per cent from one day to one week, and 6 per cent from one to two weeks.¹² The drive towards automaticity has gone so far that in some instances automatic machines are at work making tools for other automatic machines. At the same time it must be recognized that semi-automatic tools will probably not be completely replaced in many industries, if indeed they can be entirely abolished in any.

(3) *The development of power resources.*¹³ Here again the happenings of recent years far overshadow the achievements

of the more distant past. Peoples of all times and places have made some use of extrahuman power, calling upon horses or other animals for work, or upon the energy released by falling water, or even in some few instances upon the power produced by the expansion of steam; but it is only within the last two generations that the western world has witnessed the great increase in its power resources which so prominently characterizes our contemporary civilization. We shall discuss in turn the development of the steam engine, of turbines, of gas engines, and of electric motors.

(a) *The development of the steam engine.* The first practicable steam engine of modern times was that of Newcomen, who in 1705 patented a device for pumping water from mines. The cylinder was vertical, and the apparatus worked through a combination of steam power and atmospheric pressure, the steam being introduced underneath the piston to make it rise, and the fall of the piston being accomplished by atmospheric pressure upon the condensation of the steam in the cylinder through the application of a jet of water. Three men were required to work the engine, one to stir up the fire, another to let the steam into the cylinder, and a third to turn on the jet of water, and the apparatus could be used only for pumping.

James Watt in 1759 became interested in the problem of constructing a more efficient steam engine, and for over thirty years devoted most of his energies and inventive genius to the task. In the course of time he created the modern engine in all of its main outlines, among his major improvements of the Newcomen engine being the following:¹⁴ provision of a separate condensing chamber for the used steam; provision of a steam jacket for the cylinder, so that it may be kept at the temperature of the steam used; the covering of the top of the cylinder, and the introduction of steam on each side of the piston alternately, thus replacing the atmospheric pressure device of Newcomen's engine for returning the piston; the provision of valves to make this double action of the engine automatic; the improvement of the connection of the piston with the fly-wheel, so that the engine would furnish continuous motion to the attached

apparatus. Watt's engine was finally successfully applied to the driving of a locomotive in 1827 on the Stockton and Darlington Railway, after many earlier failures to make the new process less expensive than the use of horses.

The greatest difficulty with the steam engine is the large amount of heat which it wastes, some 23 per cent of the energy of the coal going up the stack for the maintenance of draft, while nearly 60 per cent is lost in the process of condensing the steam to water. Under the best conditions an efficiency of about 15 per cent can be obtained, while the average engine seldom gives over 5 per cent. As a consequence until at least 1870 American manufacturers used more water power than steam power in running their industries. The chief development since Watt has been the compound engine, in which the steam which has been used in a first cylinder is exhausted into a second larger one, where it expands to do still further work. In this manner the steam may do work in as many as four cylinders before being condensed.

(b) *The turbine.* A turbine is a wheel which is made to rotate, and therefore to furnish motive power, by the flow of water, air, or steam against vanes or buckets placed about its circumference. Whereas the steam engine makes use of the expansive power of steam, the turbine utilizes the kinetic energy of a jet of gas or liquid projected at high velocity against its blades. Its development in commercially usable form dates from the late 80's and is due to the inventions of De Laval and C. A. Parsons. In De Laval's turbine the steam moved the wheel so rapidly that it could only be used at high speeds (up to 30,000 revolutions per minute), and these were not economical; but Parsons by setting up a succession of turbine wheels of different sizes in such a way that each wheel took over a part of the energy of the steam succeeded in reducing the speed of revolution. The first turbines consumed a great deal of steam, but means were eventually devised for cutting down this loss. The turbine is not efficient at low speeds or at tasks where there is much stopping and starting against resistance, and its action cannot be reversed. But it has proved highly effective for

driving fast passenger vessels and for naval use, since it is extremely compact and works very smoothly. Turbines are also indispensable in the modern power plant, where they are used to generate electricity.

(c) *The gas engine.* In the gas engine combustible gases mixed with air are introduced into a cylinder where they are exploded behind a piston, which is thus driven forward. The gas engine is really a steam engine, boiler, and furnace all in one. This development became practically significant in 1860, when Lenoir invented an internal combustion engine, but it was not until the late 80's that Daimler devised a benzine engine which was applied to the self-propulsion of a road carriage. This marks the beginning of the automobile, though many years were to pass before it began to assume its present place in our life economy.

It was not until 1896 that the Act was repealed which limited the speed of motor vehicles travelling on British roads to 4 miles an hour. This Act required that each vehicle should be in charge of three persons, one walking in front carrying a red flag (hence known as the Red Flag Act), and that the speed in towns should not be greater than 2 miles per hour, and 4 miles per hour on the highway.¹⁵

Two or three years ago, nearly one-half of the power capable of being generated in the United States was to be found in automobile engines, and they could have provided more than twice the total power available to the steam railroads of the country, or nearly nine times all the power installed in our mills and factories.

(d) *Electricity.* The use of electricity also dates from the very recent past, both as respects its utilization as a motive power and as an illuminant. Faraday in 1832 discovered that an electric current could be generated in a piece of copper which was rotated in the neighborhood of a magnet. This is the principle of the dynamo or electric generator. The opposite principle of the electric motor was not discovered until 1873, some forty years later, when it was found that an electric current passing through a piece of metal in the neighborhood of a magnet could be made to

rotate the metal, and thus do mechanical work. By setting up a dynamo at a point where natural power is available, as near a waterfall, and connecting this dynamo with an electric motor many miles away at a place where power is desired, the current generated by the dynamo can be transmitted to the motor and there applied to the performance of mechanical tasks. The first efforts to transmit electricity over long distances were accompanied by great losses of current, but it was finally discovered that high pressure currents can be transmitted more efficiently, and transformers were therefore developed to step the current up or down to the desired pressure. The first of these high pressure transmission systems to be put to practical use was installed at Great Barrington, Massachusetts, in 1893.

The entrance of electricity into the power situation promises very materially to change the conditions under which many industrial products are manufactured. Steam must be used at the spot where it is generated, since it can be piped only with great loss of power, whereas electricity can be generated where raw power is cheap, as on the coal-fields or at waterfalls, and can then be transmitted to the factory with very little loss for distances up to at least a hundred miles. It thus becomes uneconomical under most conditions for factories to locate in large cities, and many factories are being established in the country or in small towns, while the large city becomes more and more a center for commercial and financial operations. Whether this change will be a good thing for the rural regions and for the factory worker, of course, depends on the kind of factory towns that are established, but at least it does permit a fresh start to be made.

The introduction of new artificial illuminants has also greatly changed the world we live in. The possibilities of gas for lighting purposes were suggested fairly late in the eighteenth century, and by 1792 William Murdock was using coal gas to illuminate his house. In those early days there were many sceptics, including Sir Humphry Davy, inventor of the miner's safety lamp and an early developer of the arc light (produced by running an electric current

through two pieces of carbon separated from each other by a short distance), who asked one enthusiast if he was planning to store his supply of gas in the dome of St. Paul's.

It was popularly supposed that the gas was carried along pipes on fire, and that hence the pipes must be intensely hot. Thus, when the House of Commons was first lighted with gas, the architect insisted on the pipes being placed several inches from the wall for fear of fire, and Members might be seen applying their gloved hands to them to ascertain their temperature, expressing the greatest surprise on their being found as cool as the adjoining walls.¹⁶

The first really effective use of gas for lighting, however, did not come until 1886, when the first Welsbach mantle was placed on the market. These early mantles were so fragile that they had to be delivered by messenger, and the boy who took them to customers through the streets of Vienna carried but two at a time, one in each hand. In the years that followed more durable mantles giving a brighter illumination were developed.

The early stages of electric lighting were similarly modest. Passing over the slow development of the arc light, which was hardly a general success until about 1870, when the invention of suitable dynamo alleviated many of the difficulties of the process, we may note that it was not until 1878 that Edison made a practicable carbon filament bulb. The first electric lights consumed a great deal of current, however, and in fact it was not until 1906 that the perfecting of the filament had gone so far as to make electric lighting cheaper than gas. Finally in 1914 there was developed a gas-filled globe (the earlier ones had contained a vacuum) using tungsten as a filament which consumes about one-eighth the current of the old carbon filament light.

It will be realized that all of the great changes in our industrial life that we have been discussing—the emergence of iron and steel to their present commanding position, the transfer of skill to the machine, and the development of new power resources—are still proceeding apace, and that

their effects are beginning to penetrate to the farthest reaches of every aspect of contemporary life. The most important developments, however, are of such recent date, and so many other changes are so clearly impending, that it is difficult to decide in just what direction our civilization is heading. The question is an extremely important one for the lives of millions of peoples, but its discussion must be postponed until a later chapter, where it will be taken up in the slightly broader setting furnished by a consideration of the financial aspects of our economic life, and of our inheritance of economic notions and attitudes from the immediate past.

One thing is certain—there is now available for human use a greater amount of mechanical power than at any other time in the history of man. It is not easy to turn such a statement into precise figures, though a few illuminating attempts to do so may be briefly summarized. Thus as a result of a survey made jointly by the *Electrical World* and *Power*, it was concluded that there is installed in this country some 690,000,000 horsepower of energy, or an average of 6 horsepower per person. This includes all types of energy use—central power stations, industrial plants, electric railways and steam railroads, mining, navigation, agriculture, traction (including automobiles)—and is roughly equivalent to the labor of 142 slaves per inhabitant of the United States.¹⁷ If one considers only those actually engaged in industrial pursuits, the same investigator in another analysis points out that ¹⁸

In 1869 . . . there was available to each wage worker in the industries of the country 0.6 of a horsepower. The last census, that of 1919, showed . . . an average of 3.25 horsepower.

The average industrial wage worker in this country in 1919, that is to say, was operating with machinery representing the labor of 75 slaves; or, in other words, every man, woman, and child in this country at that time had working for him in industry the mechanical equivalent (on the average) of about seven slaves. Finally, another investigator after a

careful survey of the productivity of the different kinds of mechanical devices comes to the conclusion that "a man today is productively worth ten men of the period of 1750 to 1800."¹⁹

The effects of machinery in industry

This chapter will be brought to a close by a consideration of some of the personnel changes brought about by the large-scale use of machinery in industry. The automobile industry will be taken as typical of modern developments, and free use will be made of a valuable article by Charles Reitell dealing with this topic.²⁰ He points out how the expert machinist is disappearing from the automotive industry, and continues:

This change makes more confusing than ever such terms as "skilled, semi-skilled and unskilled workers." In lieu of unskilled, semi-skilled and skilled there now exist *the tenders* who operate machines, *the technical force* who design, plan, schedule, route and cost the work, *the clerks, inspectors and foremen* who record all the miscellaneous activities of the shop, check the quality and quantity of production and who keep watch on the flow of material.

The ability to meet ("to hit") and maintain a constant machine pace; to be able to eliminate all waste and false motions; to follow without wavering printed instructions emanating from an unseen source lodged in some far off planning department—these constitute the requirements of a successful machine tender. The percentage that his actual production is below the standard production set for him is the measurement of the specific tender's inefficiency. And this percentage is more closely related to the conditions of his home life, his health and his financial problems than to any academic classifications of skilled, semi-skilled or unskilled worker. As a superintendent in the Ford plant expressed it:

"To attain a normal day's production the worker is timed so as to keep up an energetic gait for eight hours a day—this can only be done when a well-regulated living is carried on by the worker in his home life. Worry, careless living, drunkenness and sickness must all be eliminated if the employe is to maintain his high grade production in this plant."

The workers in the automobile industry may be divided into six major groups, as follows:

- I. The machine tenders (25-40 per cent of working force); operators of lathes, milling machines, boring mills, planers, etc.
- II. The assemblers (10-15 per cent); these men, "by the use of mechanical appliances and tools, working on standardized product according to definite and standardized motions," assemble the product.
- III. "Skilled workers" (5-10 per cent); machinists, blacksmiths, die makers, painters, varnishers.
- IV. Inspectors and testers (5 per cent).
- V. Helpers (*ca.* 15 per cent); varnish rubbers, machinist and blacksmith helpers, etc.
- VI. Laborers (10-15 per cent); they do carrying, handling, cleaning up, etc.

The first two groups are increasing in numbers, the third and sixth groups are decreasing; so that skill and brawn are both slowly being pushed out of the industry, though neither, of course, will ever entirely disappear. The type of man demanded by the work is very different from the man required for other manufacturing tasks of former days:

We have a greater demand for nervous and mental activities such as watchfulness, quick judgment, dexterity, guidance, ability, and lastly a nervous endurance to carry through dull, monotonous, fatiguing, rhythmic operations.

Such psychological requirements as these, of course, raise extremely grave problems. What manner of man is this who is to be watchful and dexterous for eight hours a day, day in and day out, at tasks which are dull, monotonous, and fatiguing? He would indeed be an athlete of the mind who could stand up under such a strain and show no effects, both in himself and in generations to come. It is clear that but few men could approach even moderately near to filling such a position without adjusting their whole lives to its

requirements. This then is one of the major problems of industry, which, marvelously productive though it be, is geared at such a speed as seriously to transform its human materials in ways the ultimate significance of which we are probably as yet incapable of understanding.

REFERENCES

¹ Wolfgang Köhler, *The Mentality of Apes*, trans. by Ella Winter (N. Y., Harcourt, Brace, 1925).

² A. P. M. Fleming and H. J. Brocklehurst, *A History of Engineering* (London, Black 1925), 116.

³ Fleming and Brocklehurst, 122-123.

⁴ Charles A. Beard, *The Industrial Revolution* (London, Sonnenschein, 1902), 38.

⁵ The data for this section were drawn from a large number of sources, including Fleming and Brocklehurst and articles in the *Encyclopedia Americana* and *Machinery's Encyclopedia* (N. Y., Industrial Press, 1917).

⁶ *Ency. Amer.*, Vol. 25, 563.

⁷ *Ency. Amer.*, Vol. 25, 564-565.

⁸ Consult the following references for much additional data: *American Machinist*, Vol. 60 (1924), 679-683, 723-727; *Machinery*, Vol. 22 (1915-6), 371-375; *Scient. Amer.*, Vol. 112 (1915), 538-539; *Trans. North-East Coast Instit. of Engineers and Shipbuilders*, Vol. 35 (1918-9), 179-226; *Scient. Amer. Suppl.*, Vol. 85 (1918), 278-279; *Mech. Engineering*, Vol. 45 (1925), 151-153; also articles on engineering subjects in the *Encyclopedia Americana* and *Machinery's Encyclopedia*, with bibliographies therein.

⁹ From foreword by J. D. Cormack in J. W. French, *Machine Tools Commonly Employed in Modern Engineering Workshops* (2 vols., London, Gresham, 1911), xv.

¹⁰ *Machinery*, Vol. 22 (1915-6), 374.

¹¹ *Machinery's Ency.*, Vol. 4, 6.

¹² From Henry Ford's autobiography, quoted in *Australasian Journ. of Psych. and Philos.*, Vol. 1 (1923), 297.

¹³ See references cited in note 5 above, also C. E. Lucke, *Power* (N. Y., Columbia Univ. Press, 1911), and the following articles: *Power*, Vol. 54 (1921), 584-588; Vol. 58 (1923), 396-397; Vol. 60 (1924), 937-939; *Industrial Management*, Vol. 60 (1920), 232-239.

¹⁴ *Ency. Amer.*, Vol. 25, 545.

¹⁵ Fleming and Brocklehurst, 219.

¹⁶ Fleming and Brocklehurst, 213.

¹⁷ F. R. Low, *Power*, *Power*, Vol. 60 (1924), 937.

¹⁸ F. R. Low, What power means for civilization, *Power*, Vol. 58 (1923), 396-7.

¹⁹ A. Russell Bond, Human aids to machines, *Scient. Amer. Suppl.*, Vol. 85 (1918), 278-279.

²⁰ Charles Reitell, Machinery and its effect upon the workers in the automotive industry, *Annals of the Acad. of Polit. and Soc. Sci.*, Vol. 116 (1924), 37-43.

Chapter XI

LANGUAGE

*Symbols*¹

Even casual observation suffices to show that many of our experiences function in two rather different settings. In the first place, they obviously exist and are exactly what they are; but in addition they represent or stand for something else which they are not, but to which they direct or refer us. We are all in the habit of responding to things not only for what they are, but also for what they mean. Thus as I walk down the street I suddenly receive a good sound slap on the back. I feel disposed to resent the blow, and turn around with an angry word on my lips—to recognize a friend whom I have not seen for years. My attitude at once changes; the blow is wrested out of one context and placed in another, where it commands an entirely different set of responses, although it remains exactly the same event that it was before. We have already employed the term “natural fact” to indicate a thing as it actually is, irrespective of the meanings we may attach to it. Thus in the above illustration the blow was a natural fact, which was first taken to mean an attack on my person, and immediately thereafter was interpreted as the greeting of a friend.

Not all the natural facts which actually affect our lives give rise to specific identifiable meanings, for many things act upon us without our knowledge. There is plenty of indirect evidence to prove that these items often combine or act conjointly to create meanings, but some facts by their intrinsic natures seem fated forever to remain meaningless. This is certainly the case with our own death,* which brings all processes of signification in our life to a close, and can only be experienced anticipatorily, or as dying, but never

* Not death in general, of course, for meanings are woven around that, but the concrete event which actually terminates a life.

as complete—although it is an obvious fact in human life that men do die, and that death does complete our experience in this world.

To summarize: there are an immense number of natural facts; of these relatively a very few affect the organism; and of those which do affect the organism only a very few ever become meanings; and of these meanings many only very inadequately sum up a large number of distinct natural facts, and many are false. Finally, in every culture certain natural facts, either through habit or through deliberate choice come to stand almost invariably in certain settings for other natural facts, to which they are bound by the meanings they evoke. These items may be called *symbols*.

Symbols are perfectly objective phenomena and are directly sharable, whereas meanings are psychological phenomena, and can be shared only indirectly through inference or imaginative reconstruction, based upon the interpretation of symbols or of other meaningful occurrences. Thus in *Romeo and Juliet* two servants of Capulet meet two servants of Montague, with whom the Capulets are at odds, and the following dialogue ensues:²

Sampson. Let us take the law of our sides; let them begin.

Gregory. I will frown as I pass by, and let them take it as they list.

Sampson. Nay, as they dare. I will bite my thumb at them; which is a disgrace to them, if they bear it.

Abraham. Do you bite your thumb at us, sir?

Sampson. I do bite my thumb, sir.

A certain piece of bunting with which you and I are familiar is a symbol of our country to both of us, but just exactly what America means to you or to me could only be learned through the careful interpretation of a fairly representative sampling of our relevant behaviors, including both what we say and what we do.

Symbols are of many kinds. Spoken or written words, signs, gestures, actions, objects, are all symbols whenever they stand for something other than themselves, so that they are responded to in some measure as if they were that

thing. The eagle figured on some of our coins is a symbol, since it is placed there not merely as a decoration but as an emblem of our country; the Cross is a symbol in Christian countries, the Crescent among Mohammedans (and among lovers), the swastika emblem among many peoples all over the globe; tipping the hat, shaking hands, sticking out the tongue, are symbols; and so too are all of our words, shorthand signs, dots and dashes in telegraph codes, flag signals, gestures of recognition and of communication, etc. We even create symbols to symbolize symbols—the word “symbol” is itself an example, since it is a general way of referring to any member of the whole class of symbols.

Symbols are remarkably like tools in their functioning, for they establish fairly objective relationships between meanings or intentions and natural objects, and they also greatly economize our responses. Thus the symbol “\$10” marked on an umbrella acquaints us with the merchant’s purpose respecting this object; a man in signing his name to a contract indicates that he intends to fulfill the conditions named therein; the young lady who whispers “Yes” informs her lover that his fondest hope has come true. Every symbol on the one hand expresses some meaning or intention of its user, and on the other refers to some natural fact; and in this manner it mediates between these two phenomena, and binds them more closely together.*

Languages as symbol-systems

A language is an organized system of symbols, whether it be composed of gestures, of sounds, or of written characters. This means, of course, that every language has a pattern—or else it would be a mere loose collection of unrelated symbols rather than a system—but discussion of this matter may be reserved until something has been said regarding the different kinds of symbols to be found in a language. Romanes has written usefully on this topic, in

* In modern mathematics symbolization has been carried a long way towards abstraction—towards the complete removal of contact with natural fact; but it may be questioned whether complete abstraction is possible—whether symbols can be created which are devoid of all reference to natural fact, and which depend in no way upon existences for their meanings.

spite of certain evolutionary and intellectualistic preconceptions. He distinguishes five principal types of language-signs, as follows: ³

(1) *Indicative*. These expressions are intended by the user (and hence are not mere ejaculations), but in the nature of the case they can have little or no meaning for him. Thus a baby may cry when something is the matter because he has learned that crying will bring his mother, although he may not have the slightest notion why or where he is troubled; or he may have learned to say "ta-ta" on certain occasions, without knowing why these sounds are uttered. Many a student is in just this state after he has finished cramming for an examination. He knows when to say a great many things, but he has no idea what these things he can repeat may mean.

(2) *Denotative*. Here certain sounds are regarded as the marks or labels of certain specific things, as when the child has learned to call his father "Da-da." Words when used in this manner are a little like pointers—to every word there corresponds a specific identifiable thing to which the word attracts attention. All of our proper names fall into this group. "Theodore Roosevelt" or "the Amazon River" are each intended to refer unequivocally to but one particular item. It is essential to speech that not all the terms of a language be strictly denotative (as the term has here been defined), for otherwise the language would be too unwieldly and bulky for use. One occasionally meets people, however, who seem bent on making every word into a proper noun, and who strain their speech in the effort to speak entirely without vagueness or overtones, although even the mathematician with all of his passion for clarity admits the necessity of starting his operations with a certain minimum number of undefined terms and primitive relations.

(3) *Connotative*. A symbol of this type stands for a group of objects. The user of the symbol, however, need have no very clear notions why these objects are grouped, or what relations hold between the things referred to by this symbol and other objects. Some quality of the objects named by the symbol may be responsible for the application

of the term, as when a child calls all bright objects "star," so that the ability to note likenesses or analogies may be required, though not necessarily the realization that one sees them. Practically all of us do nearly all of our thinking and talking on the connotative level, as it has here been defined. The words that we use have had a long history as parts of an extremely complex social heritage with which they are intimately connected, and in countless ways their precise values have been affected by this fact; but our acquaintance with them is usually too meager to enable us to have very clear ideas regarding their scope and possibilities. At the same time a great gulf is fixed between us and almost any stranger to our culture who tries to learn our language. Wittingly or not, we do use at least the commoner words and phrases of our language in the accepted idiomatic manner, for these usages are consonant with the culture to which we have become habituated; but the stranger's mind has been shaped by a foreign culture, and he is seldom able to master our habits of pronunciation, let alone our idioms and our manner of thinking.

(4) *Denominative*. This type of sign may be illustrated by the astronomer's use of the symbol "star" as compared with the child's. The significance of the term to the astronomer need be no more precise than to the child (for the child may know exactly what objects he calls stars), but in the astronomer's mind the term is much more intimately associated with other symbols in an ordered system of uses. Thus he distinguishes stars from planets, comets, meteors, etc., classifies them according to magnitude, distance from the solar system, motion through space, spectroscopic lines, variability, etc., discourses concerning their history, and in other ways demonstrates thorough acquaintance with them. The astronomer is acutely aware of his terms, and attempts to make them fit naturally and usefully into each other, so that they will aid understanding at every point.

(5) *Predicative*, or the making of propositions by bringing two or more denominative signs into relation—as "Stars are heavenly bodies which appear relatively fixed against the celestial vault."

The above analysis makes it clear that even the simple speech of every day contains diverse elements of very different degrees of complexity. It should also direct attention to the fact that mere words taken by themselves have little or no meaning. The context in which they were uttered is always important, as likewise the speaker, the person addressed, the precise things spoken of, etc.

The pattern of a language

Every language has its own peculiar pattern, which is as much a part of the social heritage as the kind of food that is eaten or the clothes that are worn. This pattern is unconsciously assimilated, for the most part, and it affects the experience of the user throughout, so that he naturally takes the categories and distinctions of his speech as sober descriptions of the order of nature, rather than as a body of traditional modes of expression of widely different origins which have to some extent been assimilated to each other under the stress of actual usage in the course of many generations. The genuine pattern of a language as it is actually spoken is nearly always obscured by the treatment it receives in formal grammars, where an effort is made to discuss speech according to abstract canons derived from the highly artificial study of the written remnants of ancient Greek and Latin in the light of certain presuppositions obtained from formal logic. Thus it is assumed that all statements must be propositions (since logic deals only with propositions), and that therefore (like propositions) they must assert something about something, or in grammatical terms must contain a subject and a predicate—this in spite of the fact that many meaningful statements (as “*You scoundrel!*” “*Why this nonsense?*” “*How queer!*” “*But if he does . . .*” “*Gone!*” “*Good morning!*”) palpably violate the rule.* The pattern of a language can better be viewed through a direct inspection of the forms in actual use than

* It is of course no answer to reply that certain subjects or predicates are “understood.” That in a way is precisely the point; many things are always understood of which formal grammar fails to take account. The actual uses escape the logical categories.

through a study of logical principles of extrinsic derivation.

We may approach a given language-pattern either through an analysis of the symbols of which it is composed or through an investigation into the meanings which it is capable of expressing.⁴ As we shall see, the approach through the symbols which are available is the more purely linguistic, whereas a study of the meanings which can be expressed discloses more easily the connections of the language-pattern with other cultural phenomena. It seems probable, however, that all the essential facts might be stated from either point of view.

(1) *The language-pattern as revealed by the symbols of which it is composed.* Every language is built out of certain gestures, sounds, or graphic signs. The discussion that follows will be focussed on the spoken language, since the spoken word is fundamental in determining the structure and functioning of language in all its forms. The specific sounds used in pronouncing any language always constitute a very small selection from the total number the human vocal apparatus is capable of producing. The particular sounds employed differ widely from one language to another, as do likewise the laws of their combination. The sounds themselves, quite apart from their use as symbols or parts of symbols, must be learned by the person who is to speak the language, and they can be learned only with great difficulty, or not at all, after the vocal apparatus has become habituated to other adjustments. It should be clear that our alphabet represents but a tithe of the sounds actually employed in everyday speech, and that the spelling of words offers only a very rough and general indication of their precise pronunciation. Even aside from peculiarities of spelling and pronunciation (*cf. bough and tough, meat and great, although and also, beat and sweet*), the same word is often differently pronounced in different situations (*cf. the* when spoken emphatically, when used before a vowel, and when used before a consonant).

With respect to symbols, languages again differ greatly in their elements. We shall consider in turn words, the parts

of words and combinations of words; and with respect to each of these items it will be necessary to point out that some elements are virile or reproductive while others are sterile.⁵

(a) *Words*. No two languages ever have exactly the same vocabulary, so that for every word in the one there corresponds a word (and only one word) in the other. The precise meaning of most words can hardly be stated with more than an approximation to accuracy even in terms drawn from their own language pattern, let alone through the use of concepts developed in an alien culture. Thus in the Oxford English Dictionary twenty-four large columns are required to define the various meanings of *to*, and fourteen each for *time* and *break*. The meanings of words are subject to slow processes of extension and contraction—processes which in many instances are undoubtedly going on unnoticed at the present moment. In addition some words are always dying and others are being born, and the birth and death of words, of course, take place in different directions and at different rates of speed from one language to another. This is nicely shown by comparing English as it is spoken in Great Britain with the language prevalent in the United States. The dissimilarities are many, and they are increasing, although the first settlers differed little in speech from their fellows who remained in the mother country.⁶

When a language contains no name for a specific object, a circumlocution can usually be devised which does well enough. Thus in Beach-la-Mar, a curious dialect founded largely on English which is understood throughout the western Pacific, a feather is called "*grass belong pigeon*," while a piano is referred to as "*big fellow bokus (box) you fight him he cry*."⁷ But how shall vaguer terms be translated—what, for example, is the English equivalent (or equivalents) for *fellow* in Beach-la-Mar? Every language includes a large number of words whose connotations are such that they are practically untranslatable, and every language cuts up the facts into words in its own peculiar way. A study of vocabularies also shows that the active words—those which are especially fertile in creating compounds and derivative

forms—differ from tongue to tongue. *Head, cross, ill, self, turn, light*, are such words in English, whereas *entre, haut, garde* function similarly in French. Some words breed many compounds and derivatives (thus English has nearly 400 from *horse*) whereas others (like *and, put, he*) are almost sterile.

(b) *Parts of words*. Words are not always perfectly indivisible units, since many of them can be taken apart or resolved into still more simple elements, most of which are common to a number of words. Thus *untruthfully* can be analyzed into *un-tru-th-ful-ly*, and inspection shows that each part contributes to the total meaning and is capable of functioning in other combinations (*unsound, truism, wealth, fearful, gladly*). The symbol *s* can stand for: (1) third person singular, present tense, of a verb (*he brings*); (2) plural number of a noun (*heads*); (3) possessive case of a noun or pronoun (*ours*); (4) third person singular of present tense of "to be," with certain pronouns (*it's*). Each of these meanings is represented in certain instances in other ways: (1) *he can, he may, he ought*; (2) *churches, oxen, sheep*; (3) *my, their, Queen of England*; (4) *it is*.

Certain word parts are extremely active, so that new combinations can be constructed with them almost at will, while others are static and do not easily permit more combinations than already exist. Thus in English the following are productive: *-ian* (Einsteinian, Rooseveltian); *-able* (vulcanizable, jazzable); *un-* (un-American, unradioed); *pre-* (pre-legal, pre-war); while the following are sterile, or nearly so: *-lock* (wedlock); *-th* (length, tenth, wealth, etc.); *ramp-* (rampage, rampart, rampant).

The available basic word-parts are not the same in every language, and in addition they are often combined according to very different principles. Thus in English we have the personal pronouns *he* and *she*, with their related forms (*him, his, her, hers, they, them, their, theirs*) and a certain system of uses; and we naturally think that other languages must have something very similar. That they need not possess forms like our own is shown by a consideration of the personal pronouns used by the Abipones of Tierra del Fuego:⁸

The Abipones in the first place distinguished "he-present," *eneha*, and "she-present," *anaha*, from "he-absent" and "she-absent." But presence by itself gave too little of the speaker's impression. So, if "he" or "she" were sitting, it was necessary to say *hiniha* and *haneha*; if they were walking and out of sight, *ekaha* and *akaha*; if they were lying down, *hiriha* and *haraha*, and so on. Moreover, these were all "collective" forms, implying that there were others involved as well. If "he" or "she" were alone in the matter, an entirely different set of words was needed, "he-sitting (alone)" becoming *ynitara*, and so forth. The modest requirements of Fuegian intercourse have called more than twenty such separate pronouns into being.

From the forms given in this quotation it is apparent that the Abipones possess word-parts for presence, presence sitting, walking out of sight, lying down, etc.—notions which we are able to express only through circumlocutions (and then, no doubt, only approximately in the senses given them by the Abipones)—and that they apparently have no simple general pronouns like our own.

(c) *Combinations of words.* Certain combinations of words in every language are just as much units as the simple word-parts we have just been discussing, and usually occur in but one stereotyped form. Consider the following: "*How do you do?*" "*I beg your pardon*" "*Many happy returns of the day*" "*Mr. Chairman, ladies and gentlemen*" "*Long live the King!*" These word-combinations are so thoroughly stabilized that even the stress and intonation are fairly well fixed, and can hardly be varied without attracting attention. They are, however, simply outstanding examples of an extremely pervasive fact—the fact that every language is congenial to certain word-orders, that words can no more be combined at random than word-parts can be, or simple sounds. Thus in English the sentence order is usually subject—verb—indirect object—direct object (*I gave him the ticket; his mother brought him a napkin*); while in French the normal order is subject—verb—direct object—indirect object (*je donne un livre à la fille*; but cf. *je lui donne un livre* and *je le donne à la fille*). It is possible under certain circumstances to say in English, *I gave the ticket to*

Jack; but this is what we must say in French when neither object is a pronoun. These structures are really additional language-symbols. This becomes obvious when the phrases have a different meaning than the mere sum of their elements, as: *to put off* (postpone); *to take place* (occur); *a free lance* (unattached person); *an in-and-outer* (person of erratic accomplishment).

A total survey of all the different symbols of a language would therefore necessarily include: all the basic word-parts, together with a statement of their ways of combining; all the different combinations of word-parts; all the basic words (*i.e.*, those not composed of simpler parts); all the basic combinations of words—including all word-formulas (*thank you; sincerely yours; how do you do?*) and all word-patterns (approved orders for making statements, asking questions, etc.). Such a survey would acquaint the student with the vocabulary and the grammar of the language at the same time, since these two things are always hopelessly intermingled.

(2) *The language-pattern as revealed by the meanings the language is capable of expressing.* Here the approach is not through the symbols, but rather through the general relations of the language to the culture of which it is a part. Attention is now focussed on the demands laid upon the language, rather than on the demands which it lays upon its speakers. What is it that the people wish to talk about? is now the question, rather than, In what ways does the language force people to speak? The two questions are by no means unrelated, and essentially the same phenomena are revealed by both approaches, although in somewhat different perspectives.

The chief point to be established is this: wherever two cultures differ markedly, the one (except by accident) will perforce contain no linguistic elements capable of adequately translating terms used in the other; and, since two cultures which have not been in contact at any time in the past are bound to differ throughout, except in those few instances where similar developments have appeared independently, nearly all of the demands laid upon the one language in such

cases will vary somewhat from the demands laid upon the other. Or, as Malinowski states it,⁹

All words which describe the native social order, all expressions referring to native beliefs, to specific customs, ceremonies, magical rites—all such words are obviously absent from English as from any European language. Such words can only be translated into English, not by giving their imaginary equivalent—a real one obviously cannot be found—but by explaining the meaning of each of them through an exact Ethnographic account of the sociology, culture and traditions of that native community.

But there is an even more deeply reaching, though subtler difficulty; the whole manner in which the native language is used is different from our own. . . . The use of metaphor, the beginnings of abstraction, of generalisation and a vagueness associated with extreme concreteness of expression—all these features baffle any attempt at a simple and direct translation.

Thus we often speak of the “dances” of primitive peoples—but to just what are we referring when we use the term? Are these dances to be classed with the stately minuet, the graceful waltz, the delicate ballet, the boisterous clog, the vulgar Charleston? With hardly an exception they are serious ceremonials, more nearly akin to religious rituals than to anything else in our culture.

Just as we still find in our Prayer Books that there are divine services for all the great fundamental facts of life,—for birth, for marriage, for death,—as well as for the cosmic procession of the world as marked by ecclesiastical festivals, and for the great catastrophes of nature, such as droughts, so also it has ever been among primitive peoples. For all the solemn occasions of life, for bridals and for funerals, for seed-time and for harvest, for war and for peace, for all these things there were fitting dances. To-day we find religious people who in church pray for rain or for the restoration of their friends to health. Their forefathers also desired these things, but, instead of praying for them, they danced for them the fitting dance which tradition had handed down, and which the chief or the medicine-man solemnly conducted.¹⁰

How shall we name these things, which are at the same time dances and religious rituals? Our culture contains no term of exactly the proper connotations.

Whenever primitive peoples are accused of an inability to frame abstractions, as they sometimes are on the ground that their languages are poor in general concepts, the charge usually reveals an inadequate acquaintance with the social life of the peoples in question. It is not that general concepts are missing, but that a different set of cultural needs leads to the categorization of nature in a different manner. Consider the following instances:¹¹

- (1) Williams says Fijians have a word for clapping hands lengthwise, and one for clapping crosswise; now, these definitions of *sausau* and *dhambo* respectively are sufficient for identification, but do not by a long way exhaust the whole connotation of these words: *sausau* is a rapid, high-pitched clap used to mark the rhythm in dances; *dhambo* is a slow, hollow clap which expresses respect for a superior; Fijian no more requires a common term for both than we do for bowing and playing the piano.
- (2) In Central Asia they have a name for each kind of horse according to the nature and distribution of its colour, but no word for a horse in general. This seems a triumphant proof of analytic weakness in savages; but behold! Do we know everything that an Asiatic thinks, says or does in regard to horses? . . . Colour may be all important to them: they may have superstitious or physiological ideas about it, or it may be a privilege of rank, or the price may depend upon it. . . . We have quite a number of colour terms reserved almost exclusively for horses, such as roan, dappled, bay, chestnut. . . . I think I am right in saying that a horsey person never speaks of a stallion or a mare as a horse.

We may go through life without ever noticing that whereas we have words for a bull, a cow, an ox, a calf, a heifer, etc., we have none for the species except cattle which is collective; in fact the French have had to invent *bovidé* for neutral cases in archeology. . . . The reason merely is that the *bovidé* is the most important domestic animal, and furthermore that difference of sex makes all the difference in practical use.

In some respects many of the categories of our language are no doubt more general than the corresponding concepts of other tongues; but a more thorough comparative study of cultures than has ever been made would be necessary to establish the fact with respect to any particular notion. It is not even clear whether the most useful language would be highly generalized or extremely specific; and we might eventually have to conclude that each language was best in its place. If English is rich in prepositions of position (*at, near, by, on, in, to, of*, etc.) having highly idiomatic uses, it is not bad, for we need these prepositions to describe where things are in relation to the extremely complicated furniture and apparatus of our life; but if some primitive languages lack these words, and are correspondingly rich in names for much-used natural objects, it is also not bad, for these words too are undoubtedly needed.

It is interesting to note the differences between languages, even with respect to words that must be used to translate each other. Thus the French *Dieu* is not precisely identical with the English *God*. Where the Frenchman speaks of *le bon Dieu* and uses the term familiarly in careless exclamations (*mon Dieu = dear me*), in English we refer to *God Almighty* and reserve the word only for our stronger oaths. We are all familiar with the difficulty of grasping foreign idioms, but as a matter of fact most of the words of a language are idioms. They carry with them untranslatable overtones and innuendos of meaning that can be apprehended only through fairly close contact with the culture of which they form a part.

The number and variety of language families

We must therefore conclude that the language-pattern is closely connected with the general culture-pattern, and that each leaves its impress on the other. The comparative study of languages may therefore be expected to disclose much information of value for an understanding of man's social life, whereas a study of the functioning of language in the social structure (as will be suggested in the section immediately following) should greatly increase our under-

standing of the nature and possibilities of human speech activities.

It is of the first importance, however, that students of language should not concern themselves exclusively with languages of the Indo-European group. This is but one of a large number of distinct language families, and many errors in linguistic study have been perpetuated because of the little attention which scholars have paid to other language groups. The man who studies English, French, German, Italian, Latin, Greek, Sanscrit, is really studying different aspects of the same phenomenon since these languages all belong to the same historical language family, as is shown by their similarity in basic concepts, word-forms, and general structure. Much, of course, can be learned concerning the nature and development of language from the thorough study of such a single group, but the results need to be compared and checked by a reference to the hundreds of other language families. In America alone scholars are accustomed to enumerate nearly 150 distinct language families, many composed of dialects as different as English and French, and in other parts of the globe there exist many other speech groups. With further research the number of separate families will undoubtedly be considerably reduced, but the great wealth of material for comparative study is obvious. Every one of these language families is the product of a social heritage dating far into the past, and their common forms often differ in a startling manner from those prevailing in Indo-European tongues.

Our conventional classification of words into parts of speech is only a vague, wavering approximation to a consistently worked out inventory of experience. We imagine, to begin with, that all "verbs" are inherently concerned with action as such, that a "noun" is the name of some definite object or personality that can be pictured by the mind, that all qualities are necessarily expressed by a definite group of words to which we may appropriately apply the term "adjective." . . . We say "it is red" and define "red" as a quality-word or adjective. . . . It is merely a matter of English or of general Indo-European idiom that we cannot say "it reds" in the

sense of "it is red." There are hundreds of languages that can. Indeed there are many that can express what we should call an adjective only by making a participle out of a verb. . . . And just as there are languages that make verbs of the great mass of adjectives (of our language), so there are others that make nouns of them. In Chinook . . . "the big table" is "the-table its-bigness;" in Tibetan the same idea may be expressed by "the table of bigness." . . .

But are there not certain ideas that it is impossible to render except by way of such and such parts of speech? What can be done with the "to" of "he came to the house?" . . . We can make a noun of it. We can say something like "he reached the proximity of the house" or "he reached the house-locality." . . . Such expressions are stilted in English because they do not easily fit into our formal grooves, but in language after language we find that local relations are expressed in just this way. The local relation is nominalized. And so we might go on examining the various parts of speech and showing how they not merely grade into each other but are to an astonishing degree actually convertible into each other. . . . For this reason no logical scheme of the parts of speech—their number, nature, and necessary confines—is of the slightest interest to the linguist. Each language has its own scheme. Everything depends on the formal demarcations which it recognizes.¹²

The total number of persons speaking some of these language systems is very small, since about 90 per cent of the population of the globe are gathered into the eight principal families (Indo-European, Sinitic, Semitic, Dravidian, Ural-Altaic, Japanese, Malayo-Polynesian, Bantu).¹³ Many language families are entirely extinct, while others are spoken today by but few people.

The functions of language

Language can never be understood so long as it is regarded merely as an instrument for the communication of ideas. This is not even the primary or most important use to which language is put.

The function of conversation is, it is to be supposed, ordinarily regarded as being the exchange of ideas and informa-

tion. Doubtless it has come to have such a function, but an objective examination of ordinary conversation shows that the actual conveyance of ideas takes a very small part in it. As a rule the exchange seems to consist of ideas which are necessarily common to the two speakers, and are known to be so by each. The process, however, is none the less satisfactory for this; indeed, it seems even to derive its satisfactoriness therefrom. The interchange of the conventional lead and return is obviously very far from being tedious or meaningless to the interlocutors. They can, however, have derived nothing from it but the confirmation to one another of their sympathy and of the classes to which they belong.¹⁴

The following are among the more important uses of language:

(1) *Aimless social intercourse.* When people who are casually acquainted are thrown together at a social gathering, it is considered appropriate that a few words be exchanged; and when we meet our friends it is pleasant to spend a moment or two chatting about nothing in particular. The precise conditions under which such interchanges take place will differ from group to group, of course, but this does seem to be a universal function of language, and in every tongue certain phrases and topics have almost become specialized for this purpose.

(2) *The reproduction and sharing of experiences and views.* What would life be like if we couldn't tell other people what we have seen and done, or what we hope, fear, or think? It is a joy to live our activities over again in conversation, and the language is rich with expressions that have been developed to satisfy the need.

(3) *Gaining and giving information; getting ourselves or other people to act as we wish them to; etc.* In many ways language functions as an immediate guide and supplement to action, so that we are helped or hindered in our conduct by the almost constant obligato of words (spoken either by others or by ourselves) which accompanies practically everything that is done. Excellent examples are afforded by many political speeches; almost entirely meaningless, they obviously cannot have been designed to influence through the

display of fact or logic, though they may nevertheless be extremely effective in determining action.

(4) *The expression and communication of emotion.* Few of us have failed at some time to be deeply moved by the sensuous rhythms of skillfully manipulated words. Language can be used to play upon us as though we were an organ of many stops—and so indeed we are. The music of words varies from language to language, and is no doubt both an index and a cause of some of the differences in the feeling life of the peoples of different cultures.

(5) *Ritual uses.* Certain phrases and expressions of the language become entangled in the meshes of great institutions, so that they can never be used without at least an oblique reference to their primary institutional associations. Certain words have played important rôles in the formulas of religion, the law, philosophy, science, popular thought, until about many of them there hovers an aura of sanctity and importance that affects all their uses. Even when these words are almost entirely devoid of objective content they are heavily weighted with traditional meanings, until it is hardly possible cavalierly to sweep them aside in favor of new terms as men's ideas change. Thus words like *God, justice, experience, cause, atom*, gain new life with every alteration of man's views, and wax strong instead of dying as the old interpretations decay and disappear. They have taken their places among the formulas of our life, and do not lightly to give way to competitors which claim the right to displace them.

(6) *The labeling of things.* It is unwieldy always to be under the necessity of having a thing specifically before us when we think of it, and so we quickly fall into the habit of using the names of things as surrogates for the things themselves. We are often vaguely uneasy when we cannot give an object a name, or otherwise place it in a terminological system.* This function of language should not be under-

*The author once attended a performance of Andreyev's *He Who Gets Slapped* with a friend, who was extremely dissatisfied with everything that occurred on the stage, until finally he settled back with a sigh of relief, and was heard to mutter, "Oh, I see, he's a masochist."

estimated. Often only by naming things systematically can they be understood and controlled.

(7) *The abbreviation of thinking.* Words in many instances accelerate the processes of analysis and abstraction, and in some cases make these activities possible. This is one of the chief functions of symbols in mathematics. A good symbolism greatly assists even simple operations—thus it is much more difficult to multiply XLVIII by XXXIV than to find the product of 48 times 34. In the next section the question of the relation between language and thinking will be very briefly discussed.

(8) *The accumulation and storing of the social heritage.* Thanks to the existence of language, many otherwise quickly forgotten aspects of the social heritage are treasured up for the pleasure and advantage of times to come. This was the case even before the invention of writing. Every primitive group has a large body of lore and wisdom which is handed down by word of mouth from one generation to the next. This material to a considerable extent supplements the customs and habits of the group by providing a setting and rationale for the prevailing behaviors.

The dependence of a complex culture like our own upon the transmission of its accumulated knowledge and attitudes is thoroughgoing, and so extensive use is made of the verbal and written language apparatus in this connection. The accumulations of data in our culture have become so overwhelming as regards both amount and variety that we have been forced to devise means of keeping it under control. We have card catalogues, indexes, technical periodicals listing, digesting, and reviewing the materials bearing upon specified topics, bibliographies, guides to literature, encyclopedias, etc. It sometimes seems as though we were doomed to be swamped either in our indexes or in our inaccessible data.

*Language and thinking*¹⁵

In order to prove that language affects thought, it is necessary to show that the relations of the symbols *to each other*—whether by way of their pronunciation, spelling, vocabulary connections, structural relations, or linguistic

overtones—are of influence in determining the result. For conclusive evidence on this point, one need not search further than the common word-association experiment, in which the subject is presented with a list of words, one by one, and requested to respond to each word by uttering the first word that comes to mind. Those responses are linguistically determined whose relations to the stimulus word would be significantly altered were both words translated into a foreign language. Thus if the response given to the stimulus *true* is the word *false*, the connection is probably not dependent on the language employed (since in French the two words in question would be *vrai* and *faux*, which are connected essentially as their English equivalents); but if the response to *true* were *blue*, the connection would be at least in part linguistically determined (since the corresponding French words, *vrai* and *bleu*, are not connected in the same manner as their English equivalents—*i.e.*, as rhymes).* The comparative study of a considerable number of word-associations according to this plan would speedily set at rest any doubt as to the importance of linguistic relations in determining the course of our mental operations.

A comparative study of the idioms and other peculiarities of two or more languages would lead to the same conclusion, as would a close investigation of the styles peculiar, not to individuals, but to all persons habitually using a given language—or better still, perhaps, a study of the styles achieved when individuals attempt to write in a foreign language. Care would have to be exercised in making these studies to approach each problem from the symbolic side, rather than from the meaning side, or else the influence of culture in general upon thought would have been investigated, instead of the influence of language.

While it cannot be denied that language greatly influences thought, it seems a mistake to define thought entirely in terms of language. To do this is to ignore the fact that thinking is mainly a matter of the feelings—*i.e.*, it is our name for the internal redistributions that take place under

* In addition, the linguistically determined phrase "true blue" undoubtedly influences the course of association.

the pressure of our affective states. Only a few of these refocussings of experience occur at all explicitly out in the open, where they can be consciously followed, and it therefore seems highly unlikely that our language habits play any very large part in determining their outcomes. Language habits can hardly help us in connection with processes which are absolutely unnamed, and perhaps even unnameable. Much thinking, that is to say, goes on far below the level of our language adjustments, though these adjustments are undeniably effective in determining many of our thought processes.

REFERENCES

- ¹ The writer is indebted to C. K. Ogden and I. A. Richards, *The Meaning of Meaning, A study of the influence of language upon thought and of the science of symbolism* (N. Y., Harcourt, Brace, 1923), for the clarification of his views, although his thoughts were running in the channels indicated in this section before he became acquainted with this book.
- ² Shakespeare, *Romeo and Juliet*, Act I, Scene I.
- ³ G. J. Romanes, *Mental Evolution in Man; Origin of human faculty* (N. Y., Appleton, 1889), 157-193.
- ⁴ Otto Jespersen, *The Philosophy of Grammar* (London, Allen and Unwin, 1924), esp. Chaps. 1-4, is extremely suggestive in this connection, although the author has not entirely freed himself from the formal approach.
- ⁵ Cf. Jespersen on formulas and free expressions, 18-24.
- ⁶ Cf. H. L. Mencken, *The American Language, An inquiry into the development of English in the United States* (2 ed., N. Y., Knopf, 1921).
- ⁷ For information respecting this and other similar dialects, see Otto Jespersen, *Language, Its nature, development, and origin* (London, Allen and Unwin, 1922), 216-236, and the references given therein.
- ⁸ R. R. Marett, *Anthropology* (Home Univ. Library), 145.
- ⁹ Bronislaw Malinowski, The problem of meaning in primitive languages—in the appendix to Ogden and Richards, 456-457.
- ¹⁰ Havelock Ellis, *The Dance of Life* (Boston, Houghton Mifflin, 1923), 39.
- ¹¹ A. M. Hocart, The "psychological interpretation of language," *Brit. Journ. of Psych.*, Vol. 5 (1912-13), 267-279; the quotations are from 276 and 271.
- ¹² Edward Sapir, *Language, An introduction to the study of speech* (N. Y., Harcourt, Brace, 1921), 123-125.
- ¹³ See A. L. Kroeber, *Anthropology* (N. Y., Harcourt, Brace, 1923), 95-100.
- ¹⁴ William Trotter, *Instincts of the Herd in Peace and War* (2 ed., London, Allen and Unwin, 1919), 119.
- ¹⁵ See the symposium on this topic in *Brit. Journ. of Psych.*, Vol. 11 (1921-2), 55-104.

Chapter XII

VALUES

Valuation a universal human phenomenon

Preference and choice are intrinsic features of the human situation. We are continually engaged in distinguishing the good from the bad, the better from the worse, the pleasant from the unpleasant, the profitable from the barren, the significant from the trivial. Nor do we remain neutral and unconcerned after these distinctions have been made, for we are always welcoming one thing and rejecting another, searching for some objects and ignoring or evading others, striving and avoiding, grasping and releasing, hoping and fearing, until it would seem as though we were incurably concerned with moral problems.

Although it is easy to show that different persons seldom admire and choose exactly the same things, and even that their reasons for preferring the same object are often surprisingly unlike or even contradictory, we are easily tempted to believe that our valuations possess objective validity, and to credit those who fail to perceive them with mental or moral obtuseness. This picture *is* beautiful; that man *is* a scoundrel; oysters *are* unpalatable; prize fighting *is* brutal; Woodrow Wilson *was* a great man. Such a view of the nature of values can come very close to the erection of ourselves and our whims into standards for the measurement of all creation. It is desirable to understand why it is that we tend to have this feeling respecting our judgments of value, so that we may be helped thereby to determine *its* validity. To that end an analysis of the bases of our evaluations is undertaken.

The bases of evaluation

All value estimations depend upon the combination and interaction of at least three factors, which we may call im-

pulse, group expectation, and natural fact. Although for purposes of judgment and control it is frequently proper and desirable to consider some one of these factors in isolation from its fellows, the thorough analysis of actual value situations will seldom fail to show all three factors present and active in determining the course of events.

(1) *Impulse*. By impulse is meant the momentum or drive of reflex arcs under stimulation. As we have seen, the reflex arc functions as a unit, so that stimulation of sensory endings causes energy transformations which push straight through to muscular or glandular action (besides stimulating other reflex patterns which behave in similar fashion). This process is not absolutely instantaneous. The speed of conduction of the nervous impulse along the nerves in certain instances is somewhere near 400 feet per second, the reaction time to a light stimulus under controlled laboratory conditions being a little under one-fifth of a second. Thus time is allowed for conflict and coöperation between impulses—for a certain amount of organic facilitation or inhibition of even the most direct reflex responses.

In the beginning impulses are apparently perfectly objective occurrences, needing no justification and being given none, so transparently right and proper are the demands they lay upon the organism.

Every creature *likes* its own ways, and takes to the following of them as a matter of course. . . . It is not for the sake of their utility that they are followed, but because at the moment of following them we feel that it is the only appropriate and natural thing to do. . . . To the broody hen the notion would probably seem monstrous that there should be a creature in the world to whom a nestful of eggs was not the utterly fascinating and precious and never-to-be-too-much-sat-upon object which it is to her.¹

How, then, do we learn that some of our impulses are wrong, undesirable, unesthetic, tasteless—in short, possess negative value? How do we ever acquire moral normality? For normality is not inborn; it is itself a norm or standard which can be achieved only by training, by the development of habitua-

tions and inhibitions not all of which are especially "natural" to the individual considered in isolation from his fellows.

The course of individual experience considered artificially quite apart from all other factors would, no doubt, furnish a certain leverage for the development of notions of value. For one thing, the clash of competing impulses would not fail to raise questions of comparative worth, as when hunger and drowsiness, curiosity and fear, affection and selfishness, present simultaneous claims for attention and action. Or acquaintance with the unhappy results of previously uncriticized responses might lead to a realignment of impulses, while the organization of responses in the course of development in certain cases would lead us retrospectively to judge our past conduct. But as life is lived two other fairly distinct factors are effective in the value situation.

(2) *Group expectations.* Every group is engaged in certain enterprises in which its members are expected to participate, and every group has elaborated certain attitudes which are held to be objectively descriptive of the things to which they are applied. All the possible ways of performing a given act are never exhibited by a group; and all the possible attitudes towards a given bit of conduct are never enunciated. Always there is selection and bias, usually unconscious, in favor of certain things as against others. This is the social phase of the value situation; just as the initial uninhibited impulses of the individual are taken for granted until some special occasion for questioning them arises, so the folkways of the group govern its conduct as though by natural right.² And the inertia of the group forms far surpasses that of the reflex arcs, even after the latter have become stabilized through the formation of habits, since the group behaviors can be changed only by altering the habits of many men. Long after the conditions that gave them birth and relevance have passed into the limbo of decay, a society may be found going through the motions pertinent to former arrangements or perpetuating cherished though moribund conceptions.

The individual must find a place for himself in this world of folkways with its already elaborated value systems. In-

deed, he himself is already evaluated and placed, in considerable measure, before he ever appears on the scene. Even if the members of his group attached no worth whatever to their activities—a ridiculous assumption—the mere fact that an individual had entered into the fairly fixed and arbitrary behavior patterns of his group would necessitate no little readjustment and inhibition in his impulsive life. But his fellows are always as a matter of fact by no means indifferent to his conduct. For his own good and for theirs, they believe they are entitled to expect a certain minimum of conformity to their standards, and on this basis the necessity for the elaboration of yet other value judgments arises.

(3) *Natural fact*. Up to this point the analysis might possibly lead to the rather hasty conclusion that the process of evaluation is eminently artificial—that it contains no elements of reality. Nothing could be further from the truth, as even the preceding discussion would suffice to show. Into every value situation there enters the element of natural fact, of arbitrary objectivity. By a natural fact is meant something which is *so*, quite irrespective of whether we or anyone else would like to have it so, and irrespective too, of our ability to state just *what* it is. Death in this sense is a natural fact, and so is birth, the sun, impenetrable objects, disease germs, the space which separates one thing from another, poverty, the growth of trees, love, and all the catalogue of things and processes that really *are*. Not all of these natural facts are known or even knowable, and a good many are known but ignored (for they need not be obtrusive), but they enter irremediably into every value situation and affect its outcomes. Some evaluations no doubt pass judgment on the facts, and some facts are no doubt amenable to change under the proper pressures, so that even natural facts may have a history, but whatever they be at a given moment is of vital importance in the process of valuation.

The value situation, then, is one in which impulses, group expectations, and natural facts act upon each other. Through the interaction of these factors preferences are formed and organized. Some organization of preferences is highly nec-

essary, since a life of unresolved conflicts is eminently unsatisfactory, whether these conflicts be between impulses in the same individual, between individuals, between individuals and group expectations, between individuals and natural facts, or between group expectations and natural facts. The energy and feeling wasted in such disturbances furnish strong incentives for the establishment of some hierarchy of responses, though it must not be thought that many people carry the organization of values very far. There are always many unresolved problems in the most ordered life, and in the field of values no less than elsewhere many loose adjustments prevail.

Values not merely private and subjective

It should now be clear that our impulses and our folkways, and likewise our valuations, are themselves natural facts. They most certainly do exist even when they are most faulty and inadequate. This does not mean that men who do not feel their pulls need render them homage, but merely that if they are wise they will take account of them as genuine existences. Even the skeptic must face the fact that other men are believers.

Values not only really exist—we might have known that without the foregoing analysis—but they contain extrapersonal elements. They are not spun out of our insides, as a spider spins its web; they assume form in the physical and social world somewhat as a plant grows out of the soil. They arise naturally through the interfunctioning of impulses, folkways, and facts, and they attain ultimate validity in the degree that they assimilate these factors to each other. To say that this seldom happens is only another way of remarking that not everyone succeeds in living the good life. The more usual approximations to this ideal may be regarded as centering on the desired end, though removed at varying distances from it. If this is the case, value judgments (as “This is a beautiful picture,” “I love you,” “God is good”) are themselves to be judged, not so much as problems in mathematics are, by a comparison of the response with a fixed standard, but rather by the *breadth* of the judgment,

by the number of diverse items which it holds in solution. There may be no disputing over tastes, but a narrow and illiberal preference stands self-condemned. This, perhaps, is why we often either precede or follow our value judgments with analyses or explanations, whereas we seldom support a mere statement of fact by argument. If I state that Julia is beautiful, the remark stands or falls according to my reputation as a connoisseur of feminine pulchritude, and so I am strongly urged to supply a bill of particulars, while if I remark that Mary is five feet six inches tall no explanations seem necessary unless my veracity is specifically questioned.

Ideals

Men pass judgments upon themselves no less than upon their fellows, though their self-estimates seldom possess much objectivity. They also spend much time daydreaming about the future, under the pressure of their affective needs, and find pleasure in elaborating plans for a brighter day just ahead. These plannings and imagined fulfillments can cover the whole range of time to come, from "What next?" to "What shall I do that I may inherit eternal life?" Each such imagined consummation in its own way is an ideal, although that term is perhaps more properly reserved for the larger life aims which are more heavily charged with emotion, and which envisage ends that are held to be eminently desirable. Our notion of ourselves in most instances is just such an ideal. It does not soberly describe the behavior of the biological organism which is us; it is more our picture of the person we should like to be, which we place before ourselves as a reminder and a guide in the midst of life's distractions.

We are prone to regard our ideals as purely personal constructions, and in a certain sense, of course, they are personal, for nothing else gets so close to our inner nature and possibilities. They are undeniably in large measure a product of our fantasy life, which often seems to go its way in relative independence of molding influences from the outside. This appearance, however, is illusory, for we get our

most idiosyncratic preferences no less than our conformities from the group life. An ideal in nearly all instances is a picture of something desired but not immediately available as our life is now arranged. But the group furnishes us with our dissatisfactions no less than with our satisfactions; it presents the alternatives that shall have the power of appealing to us when we become dissatisfied; it develops and sharpens whatever powers of criticism and understanding we may apply to the elaboration of these alternatives; and it furnishes the criteria upon which we trust or distrust our findings. In other words, the methods and materials for the criticism of life form a part of the social heritage no less than the apparatus of conformity. Persons suffering from mental diseases involving extensive lack of orientation (*i.e.*, *rapport*, or normal contact with the physical and social environment) would perhaps in some measure have to be excepted from these remarks, but they certainly apply to normal individuals. The prevailing western ideal of a strenuously active and productive life, for example, becomes nothing less than nonsense in the tropics. The ideal of a prosperous and well-to-do society does not interest India so much as the production by the community of a holy man who possesses a rich inward spiritual repose.³ Were we to be moved to attack the ideals of our own culture, we would not use the notions of other peoples (except as these notions had filtered into and affected our own culture stream), but would search for weapons from our own cultural armory for the purpose. Thus we might try to prove that the strenuous life was inefficient, and quote the investigations of scientific managers who have shown that the day's work should be interspersed with liberal rest periods; or we might trace the evil effects of overexertion throughout the organism.

The value of ideals

It is a peculiar feature of our ideals that they are often frankly unrealizable. "In the organized value situation, the object, in order to be satisfactory, must have such existence as is implied in our expectancies with reference to it."⁴ This means, of course, that ideals are often mere wish fulfill-

ments. It is always dangerously easy for imaginative persons to retreat from the world of fact into the world of fancy. That world is causally connected with the world of fact, as we have shown, but our wanderings therein need not adapt us for living the life of every day. "Subjective ideals may be a fair substitute for reality, but they are a bad preparation for it."⁵ The satisfactions which the mind can conjure up are so much brighter and more easily secured than those which this drab world yields to sweat and toil that many a person has transferred his allegiance from this world to some country of the mind. Among the world's best citizens, however, are those who, though in constant touch with Paradise and all countries beyond, are not blinded by lands whose shadows are as our sunshine, and can still do their part in this world's work for all their travels in Utopia. At the same time, it must be admitted that a dissociated dream world is absolutely necessary for the mental health and happiness of many people. When life's tempests beat heavily upon a person of delicate fiber and tear him loose from all realizable hopes, is it strange that he should take refuge in a dream? Great losses are not always reparable with this world's goods; and it occasionally becomes necessary to liquidate the disappointment of a bankrupt soul by a draft drawn on eternity.

It has indeed sometimes been held to be the special privilege and virtue of ideals that they are unattainable. An ideal that could be realized, it has been said, would not be genuine—would the things we strive for be worth having if we actually expected to achieve them? This verges on a dangerous sentimentalism, although it certainly does not belong to the essence of an ideal that it be attainable.

An ideal is like the north star which the colored slave would follow, not with the expectation of ever reaching the star but under the hope that by following it he might better his condition.⁶

Our almost unlimited capacity for self-deception makes it clear that not all ideals are unmitigatedly good. To say of a person that "He means well" is hardly to offer him praise,

although we sometimes offer our own good intentions as a substitute for good deeds. The man who means well may be hindered from doing well because the consciousness of good motive stands in the way of any genuine effort to improve his actual conduct. Consequently there have been those who have deprecated the formation of ideals as enervating, and as taking the mind off reality and its actual possibilities.⁷ Such a position, were it itself to face the facts, however, would appear rather as a movement for the improvement of our ideals than for their abolition, since as men are made they naturally create imaginative pictures of themselves which are only obliquely related to their actual lives. It would seem to be the part of wisdom to take this for granted, and to devise means for the correction and improvement of men's ideals. In addition, allegiance to ideals, even to low ones, is of inestimable value in maintaining human morale and fellowship. There are few who find it possible to live a satisfactory life when deprived of the steady conviction that certain things are supremely worth while. The particular nature of the things to which we hold fast is often less important than that there should be something to which we can cleave.

Some contemporary ideals

A description and history of all the widely accepted ideals of our culture would be extremely interesting, but a thorough handling of the topic would easily fill a volume, even if nothing were said of the more specialized ideals of the various groups and professions within the social order. There are a surprising number of these smaller groups, each with its own particular code of loyalties and aspirations, and the precise meaning of the various elements in the general body of ideals common to the culture is, of course, altered from group to group. The following are a few of the more generally accepted ideals of our civilization: patriotism; humanitarianism—regard for the lives of others; democracy—"each man to count for one, and none for more than one"; being educated—which is usually taken to mean having a certain amount of book learning, rather than any

necessarily useful or enlarging acquaintance with things; being a gentleman; being a "good fellow"; romantic love—still our typical feeling towards chosen members of the opposite sex, and affecting the whole range of sex relations; monogamy; thrift; activity—*cf.* "the go-getter"; productivity; wealth; "service"; "success" as currently defined; etc.

The spheres of enforced uniformity

Before stating how the established values and ideals of our culture may properly be criticized and subjected to revision, some understanding of the various types of conformity expected of us seems necessary. The rules, conventions, and standards governing conduct in any society are always numerous, and depend upon a large variety of sanctions. For many of them no very rational explanation can be offered; they form a part of the vast body of tradition transmitted to us from the past, and the only consolation open to us concerning them is the reflection that they may at some former time have had a pertinence which they now lack. Much of the ritual and apparatus of courts of law is in this condition, as likewise our conventional attitudes towards the groups and occupations of our culture. With respect to many enforced acts, however, the advantages of social control and regulation are obvious, even though it be admitted that the concept of social welfare is appealed to very frequently upon nebulous and indefinite grounds. We must know what we can expect and what is required of us, in many situations, or the wear and tear of the little details of life would be completely engrossing, and we must have rules of some sort for the handling of the conflicts and differences between individuals which are bound to arise.

The requirements of the group seldom stop at just this point, however. Law, religion, public opinion, and conscience (itself a social product) also penalize divergences from artificial norms. As a matter of fact our group can hold us responsible for anything. Many people have been punished by law, and for a long time to come others will continue to be punished, for deeds actually committed by them under conditions which rendered them psychologically

irresponsible, though legally culpable. A noted psychiatrist once stated the following as the conditions of responsibility:⁸

The accused must have willed the act, intended the harm, and desired primarily his own gratification; the act must have been done on inadequate provocation, and the accused must know and appreciate the circumstances in which the act was done. If any of these factors be wanting, responsibility is impaired or abolished.

Few of the acts for which men are legally punished conform to these strict conditions of responsibility.

Among the fields in which conformity is expected, and where nonconformity is open to penalty, are the following:

(1) *Taste*. This term may be taken to include such things as etiquette, good manners, proper appreciation of "the good, the true, and the beautiful," interest and concern in accredited topics of discussion, accord with the prevailing fashions of dress, thought, and behavior, a certain suavity and poise, and all the minor amenities of social life. The degree to which our lives are governed by essentially trivial conformities can hardly be overestimated, and no small part of the training of the young is devoted to nothing more than the effort to stereotype action in this field. Let it not be thought that living together offers no opportunity for the development of intrinsic social graces. There is every need for a liberalizing art in this intimate field, though it can hardly be attained by a dull and stupid conformity to needlessly arbitrary conventions. But the codes of "good taste" also invade the realms of esthetics and of thought and prescribe the feelings and opinions which are there considered proper, and in this manner an excess of rigidity is often introduced into the two realms where man might be most free. We listen to a new piece of music or to a new idea not so much with our ears as with our memories, and are prohibited from enjoying or understanding many things because of the patterns already established in our minds. Our ideas and feelings become fixed through the persistent indoctrination of accepted views, until we almost lose the capacity to learn new things from experience.

One might succeed in explaining to the dullest of men the most difficult of problems, if he had no previous conception in regard to it; but it is impossible to explain to the cleverest man even the simplest matter, if he is perfectly sure he knows everything about it.⁹

(2) *Mores*. The Romans used this word to cover all those customs of the group which were regarded as somehow serving the social good, and as having behind them the quasi sacred sanctions of tradition. Sumner, who was influential in introducing the term into contemporary sociology, defined the *mores* as the totality of "the popular usages and traditions, when they include a judgment that they are conducive to societal welfare, and when they exert a coercion on the individual to conform to them, although they are not coördinated by any authority."¹⁰ By the former criterion they may be distinguished from the conformities and usages of which we have already spoken, while the absence of the organized sanctions of a public authority differentiates the *mores* from the formal law of the community. Not that violations of the *mores* therefore go unpunished; but that this punishment is not meted out by the arm of the law.

The *mores* or popularly sanctioned usages of a group, indeed, are many times more important than the laws in determining how men act. The written law has little efficacy when it fails to mirror the established *mores*. It has long been the habit of the American people to pass laws and then break them. But it must not be thought that the behests of the *mores* are obeyed by all men alike without let or exception. The accredited folkways themselves constitute a norm or standard, and a considerable divergence between the rule and the actual practice can frequently be observed. It often requires imagination, initiative, and power really to put into working shape ideals which are accepted as obvious by nearly all the members of a group, as has many times been proved in the administration of charitable relief and in the organization of foundations for research. The very multiplicity of the *mores* also leads to a certain amount

of individual variability, since it is not unusual for a code to embody conflicting requirements.¹¹ In addition, there always exists a certain amount of skepticism regarding the value of many customs, a constant series of practical innovations, evasions, and changes, even in the most static society, and at least a minimum of tolerance or indifference as respects the performance of many acts. Even so, however, when everything possible has been said in mitigation of the absolute invariability of accord with the *mores*, the fact remains that their sovereignty is in the main undisputed. Whether in political or in economic or in social relations, in our dealings with groups of people, in our casual intercourse with strangers and acquaintances, or in our more intimate association with friends and loved ones—in all these spheres of action, thought, and feeling the established value judgments guide us through declarations of right and wrong, of the advisable and the improper. The desire to be respectable and admired is often here reinforced by the still small voice of conscience uttering its moving recommendation of the accepted ways. Men are pulled from without and pushed from within along very much the same path, since the voice of conscience is very largely the internally reflected voice of the group.

The insipidity and triviality of most philosophic attempts to organize and rationalize the field of values furnishes striking evidence of our dependence on the *mores* for our ethical notions. Philosophers whose metaphysical systems astound by their profundity, daring, and address commonly succeed only in being shallow and in uttering bewhiskered commonplaces when they turn to problems of conduct. Even those thinkers whose moral theory partakes of the garishness and imaginative vigor of their general thought more often than not discuss moral practices in such a way as to make it appear that our control over truth in this much vexed field was well-nigh complete.

The devices used by the group to secure conformity when it is endangered are exceedingly numerous, and range all the way from the infliction of death to the "Tut-tut" of scandalized old ladies. The body may be injured, the char-

acter reviled, the soul condemned to everlasting punishment or excommunicated from the fold of the faithful, social relations refused or exile required, property confiscated or one's means of livelihood attacked, shame engendered or praise withheld, displeasure and grief at the undesired conduct exhibited, and—most important of all in many instances—the individual through long-continued social pressures of an obscure sort is made to find his own nature divided against itself, so that in standing alone against his group he is forced to fight a civil war within his own soul. In most instances, of course, the desirability of conforming to the group standards is never questioned.

(3) *Regulations.* Every group demands adherence to certain rules of conduct which (it would cheerfully be admitted) are entirely arbitrary, but which nevertheless are open to defense on the ground that they serve the public convenience. Without such rules we could not be sure which of a number of equally attractive possibilities other people would elect to follow, although some correspondence must be established between their actions and ours. And so it is decided, often without rhyme or reason, that one of these possible ways of acting is right and the others wrong. Such regulations in the beginning need contain no more than an absolute minimum of ethical significance, although as time goes on they may more and more take on the appearance of being written into the nature of things. The policeman who summons a driver for violating a traffic regulation seldom acts with the humility of a public servant administering a rule of convenience. A lack of social feeling, however, is no doubt argued in the person who gratuitously and upon no grounds of principle consistently evades these regulations.

The number of social regulations tends to increase as life becomes more complex and interdependent, and at the same time the rationale or significance of many regulations becomes obscure. In a large city the sanitary code must be more precise than in rural districts, so that it is a greater task to know and follow the regulations and not so easy to see the precise reason for every rule, while at the same time the difficulty of administering the code is greatly increased.

As a consequence there is a limit to the efficacy of regulations which are not pretty thoroughly supported by the *mores* of the group.

(4) *Law*. A law, as the term is here used, is a prescribed rule of action emanating from a law-making body and enforced by public officers, who administer the punishments which are attached to its neglect or violation. Laws have the general appearance of expressing the formal social control of conduct, although it must be recognized that they are often enacted by unrepresentative minorities, and under some circumstances even by single individuals. In every instance the enforceability of a law depends upon the prevailing *mores*, taken in conjunction with the power available to the enforcing agents. The body of formal law never perfectly coincides with the *mores*, although the two fields will overlap to a considerable extent, most of the major infractions of the legal code also constituting offenses against the *mores*. Jeremy Bentham in a classic discussion of the question concluded that legislation was inadvisable: where it is *groundless*, as when the mischief created will inevitably be remedied without legal action; where it must be *ineffacious*, as when it cannot affect the persons against whom it is directed (they are insane, drunk, constrained by a superior force, etc.); where it is *unprofitable*, as when the evil of administration or of the stipulated punishment would outweigh the evil of the offense; and where it is *needless*, as when the mischief might be prevented more cheaply, as by education.¹² The influence of the *mores* upon the legal situation has an obvious bearing on each of these considerations.

The contemporary spheres of law of major importance for the present discussion are as follows:

(a) Substantive or positive law. Substantive law defines the normal relations between members of the group, establishes the rights of one person as against another, and describes the recognized forms of social interaction. This involves, among other things, a codification of property rights, including the administration and inheritance of wealth, a statement of the conditions under which one man may hold another liable for his promises (law of con-

tracts), and of the manner in which persons may combine in the performing of functions (law of partnerships and of corporations), delimitation of the rights of husband and wife, parent and child, guardian and ward, employer and employee, buyer and seller, landlord and tenant, etc.

(b) Adjective or remedial law. Adjective law deals with deviations from the normal order, and attempts to reinstate the conditions existing before the offense, to indemnify those who have suffered loss and injury, or to punish the offenders. It has two chief divisions: the law of *crimes*, which deals with definitely antisocial acts, either directly attacking the political order, as treason, forgery, etc., or acts directed in the first instance against persons or their property, as murder, theft, arson, etc.; and the law of *torts*, which covers wrongs against persons which are less distinctly antisocial (and may even be unintentional), as trespass, libel, alienation of affection, negligence, etc. Crimes are offenses against the state, which itself endeavors to bring the offender to task, whereas torts are offenses against individuals, who must bring suit to recover damages or reparation.

Not all uniformities of action or of evaluation are enforced

In the preceding section the discussion centered around the different spheres of enforced uniformity in our culture. It must not be thought, however, that a consideration of taste, the *mores*, regulation, and law exhausts the instances in which we may be found conforming to group patterns. Quite without the slightest sense of compulsion our life becomes an expression of the social heritage—indeed, the activities of our culture (as was pointed out in earlier chapters) constitute the indispensable materials of self-realization. It is therefore gratuitous to look for the policeman or the judge whenever men are found engaged in common tasks or in the expression of the same evaluations. We act and think and feel so nearly alike because so nearly the same materials were employed in our construction, and in countless situations when acting entirely in accordance with our own feelings we unconsciously reveal ourselves as participants in a particular cultural heritage.

The criticism and evaluation of existing standards

The standards of a group are criticized and changed in essentially the same manner as the standards of the individual are formed—through the interaction of impulse, expectation, and natural fact. This is the case, of course, because there is no group apart from its constituent individuals, and no group values resident outside of individuals. The values common to the group can only change through changes in the values of members of the group. This process, however, is continually going on, and so there is always a certain amount of pressure towards the change of the commonly accepted values. Anything which acts to give this pressure a constant direction will therefore have the effect of changing the prevailing views.

A number of things are capable of producing this result. When people move into a new natural environment the stage is often set for great changes in their views, as can be seen when inhabitants of the temperate zones migrate to the tropics, or when urban folk become pioneers. With a change in occupations and in other fundamental life activities, similarly, new notions are bred. When inventions and discoveries give a new direction to life and thought, once more, the resultant changes may invade every aspect of culture and greatly affect its standards, as was strikingly illustrated by the startling and still incomplete effects of the Industrial Revolution on the western world. The contact and fusion of cultures is also a potent factor in the alteration of standards. People who have lived in isolation from each other are bound to develop different norms, and when through diffusion these divergent standards are brought into contact much intercriticism and adjustment is possible. Thus the meeting of East and West offers opportunity for the interchange and mutual criticism of values. Altered ideas respecting the past may perhaps be considered as a special instance of cultural contact. The same process goes on within a culture when fairly well isolated groups come into closer relations, as when persons with different interests and training join in a common enterprise.

It is to be noted that in all of the instances cited the

primary condition for a change in standards is an altered perspective in terms of which the old materials may be viewed. This should be taken strictly to heart in connection with all deliberate efforts to improve our standards, and indeed in every instance where an enlightened control is attempted over any human processes. The situation has two phases:

(1) It is absolutely necessary to work in terms of the materials already at hand and accepted. The existing situation must be taken for granted, not as immutable and unchangeable but as present and real. It is folly to deny the existence of the very thing one is criticizing. No proposal for change is worth considering which depends upon magic—which supposes, for example, that men will be very different creatures under some new arrangement which contains no devices for making them different. Bertrand Russell has some wise words upon this topic: ¹³

Socialists . . . imagine that the Socialist State will be governed by men like those who now advocate it. This is, of course, a delusion. The rulers of the State then will bear as little resemblance to the present Socialists as the dignitaries of the Church after the time of Constantine bore to the Apostles. The men who advocate an unpopular reform are exceptional in disinterestedness and zeal for the public good; but those who hold power after the reform has been carried out are likely to belong, in the main, to the ambitious executive type which has in all ages possessed itself of the government of nations. And this type has never shown itself tolerant of opposition or friendly to freedom.

There is here indicated the need of knowledge or understanding of the existing state of affairs as a prerequisite to serious efforts towards its improvement. This knowledge can seldom be achieved with sufficient thoroughness for the purpose without great effort and unusual advantages, whether of position, of training, or of natural aptitude.

(2) The old materials must be viewed in a different perspective of facts and possibilities. When they are considered merely in their present settings and relations, it is only

possible to take them or leave them; if they are to be critically evaluated or deliberately changed they must somehow be brought into new connections with relevant data, so that the process of criticism may not prove irresponsible or sterile. This is the great advantage of breadth of vision and a wide experience, for out of many and varied contacts is born the capacity to look upon the old as though it were new, and upon the new as though it were old. The man who is in the habit of doing this has to some slight extent freed himself from slavery to the here and the now.

The success of our deliberate efforts to change existing arrangements therefore depends upon the adequate envisaging of instruments competent to transform things as they are into things as they might be. The need is for tools which can be applied to the existing situation in such a way as to transform it into another which we have good reason to believe is more desirable.

REFERENCES

¹ William James, *The Principles of Psychology* (N. Y., Holt, 1890), Vol. 2, 386-387.

² See W. G. Sumner, *Folkways, A study of the sociological importance of usages, manners, customs, mores, and morals* (Boston, Ginn, 1907).

³ See the essay by Dhan Gopal Mukerji in the volume entitled *What is Civilization?* (N. Y., Duffield, 1925).

⁴ J. E. Boodin, Value and social interpretation, *Amer. Journ. of Sociol.*, Vol. 21 (1915-6), 95.

⁵ F. L. Wells, *Mental Adjustments* (N. Y., Appleton, 1917), 23.

⁶ Charles E. Garman, in *Amer. Journ. of Psych.*, Vol. 9 (1897-8), 606.

⁷ Cf. Sumner, 201 f.

⁸ C. A. Mercier, in Bernard Hollander, *The Psychology of Misconduct, Vice, and Crime* (London, Allen and Unwin, 1922), 193.

⁹ Lyof Tolstoi, quoted in W. Jethro Brown, *The Underlying Principles of Modern Legislation* (6 ed., N. Y., Dutton, 1920), 1.

¹⁰ Sumner, iii.

¹¹ Cf. the travesty of this situation in the character of Pooh-Bah, Lord High Everything Else, in W. S. Gilbert, *The Mikado* (Modern Library ed.).

¹² Jeremy Bentham, *An Introduction to the Principles of Morals and Legislation* (first publ., 1780; Oxford, Clarendon Press, 1907), Chap. 13. See also Chap. 14 of the same work.

¹³ Bertrand Russell, *Proposed Roads to Freedom; Socialism, anarchism, and syndicalism* (N. Y., Holt, 1919), 107-108.

Chapter XIII

COMMON SENSE, OPINION, AND INNOVATION

Matter-of-fact knowledge in the group

Every society possesses a large though somewhat haphazard store of information of different degrees of utility and accuracy concerning the nature and behavior of the various items in its environment, together with a knowledge of the techniques which are necessary to turn this information to practical account. Thus in a primitive group the men know when, where, and how fish are to be caught, and they are familiar with the habits of wild game; they can forecast the weather from an inspection of the heavens and they are acquainted with the order of the seasons, together with the bounties and scarcities afforded by each time of year; they are familiar with the region in which they live and how to get from place to place; they are old hands at clearing away the brush, digging wells, cutting down trees and stripping them of bark, making fire, finding honey, telling time by the stars, chipping flints to make tools, and a thousand other similar tasks. Similarly the women perform a multitude of functions, from the planting, tending, and harvesting of foodstuffs, the gathering of fruits and berries, caring for the young, cooking the foods, etc., down to the tiniest features of the daily routine.

In considering the life of a group we are likely to ignore this enormous body of unostentatious matter-of-fact, and to concentrate our attention upon the gaudier and more pretentious constructions of the culture. The common-sense knowledge of a society seldom receives its due even in learned anthropological treatises, although it is absolutely indispensable for the maintenance of the group life, and in addition constitutes perhaps the most important differentiating cultural feature of a group, so far as its actual life is con-

cerned. The individuals who use this knowledge in their daily lives almost invariably take it entirely for granted, and are seldom properly appreciative of its importance, although persons who are exceptionally competent in its manipulation are respected. And yet, it must be repeated, this common-sense knowledge forms the necessary basis for all the developed arts and more than any other single thing keeps the group alive and prosperous.

Although cultures can easily be differentiated by a comparison of the specific common-sense knowledges and practices upon which their daily life depends, it is perhaps in this field also that cultures are most nearly alike in their more general features. This is, no doubt, due to the basic identity of human biological needs under all the diverse conditions of cultural life, on the one hand, and on the other to the fairly limited possibilities offered by the natural environment for the satisfaction of these needs, as compared with its relative indifference to the manner in which many other cultural patterns function. Wherever men are found, they urgently need to breathe, to eat, to provide themselves with shelter against the elements, to protect themselves against environmental pests and enemies, and to store up reserves against a lean season. Most of the other impulses shared by human beings are by no means so ubiquitous and insistent, and they are therefore canalized in a greater variety of cultural forms.

In no culture, of course, is the whole body of common-sense knowledge controlled by every one. Thus in our own group the homely knowledges connected with the preparation of food belong almost exclusively to the women, while the men are as a rule better acquainted with the handling of the common tools available to practically all members of our society. Farmers are well acquainted with many simple facts of basic importance in agricultural operations that escape city folk, and sailors share technical secrets not known to landlubbers. In these broad differentiations we see the marks of specialization in activity and interest, a topic that will be discussed in the next section but one.

Opinion in the group

Matter-of-fact knowledge is seldom kept entirely free from secondary growths of interpretation and explanation, and in many instances the two things are inextricably interwoven, so that both are acted on together. Thus the tribesman knows how to catch fish, but he also knows what rituals to go through to insure catching them; and in his own thinking the ritual may easily receive more credit for a successful fishing trip than the apparatus and techniques that were employed. Parallel to the operations of daily life and influencing them, there exists a store of opinions, surmises, conjectures, and explanations generally accepted by the members of the group as pertinent and enlightening.

But opinion also goes beyond matter-of-fact. The homely knowledge of the group deals almost entirely with things close at hand and under the eye, or with nature's great cycles. But men are also forced to adjust themselves to unusual events, to ominous and destructive phenomena, and they are rendered curious by the things lying just beyond their vision and control, and encouraged to speculate concerning many matters imperfectly known to them, so that we find their imaginations running beyond the data and framing explanations on slight or no evidence. Considerable portions of opinion, together with a modicum of fact, make up the greater part of the subject matter of religion, philosophy, economic beliefs, etc., but many of the surmisings of a culture are far too nebulous and variegated to be catalogued with success under any very precise headings.

The distinction between opinion, or unsupported belief, and well-proved fact is often difficult to make, especially when one's own views are under examination, since our feelings are always likely to bias our judgments. The difficulty is to some extent remediable, for techniques of thought and action can be developed to help us refine and criticize, though seldom if ever entirely to abolish, our biases. In the end, however, the necessity of making choices that go beyond the available evidence cannot be completely avoided. William James in a famous essay entitled *The Will to Believe* developed this point in connection with an interesting in-

tellectual dilemma.¹ What is our aim in intellectual matters—to *know the truth, or to avoid error?* The two possibilities lead to different ways of acting, and are not reconcilable, since a man will take chances if his aim is to know the truth that he would condemn if he is anxious to avoid error. Is it any worse, asks James, to be duped by hope than by fear? In this matter as in many others we must act according to our lights: while James defends our right to believe in certain instances where conclusive evidence is not available, but where we must nevertheless act as though one view were true, Karl Pearson attacks it:²

Where it is impossible to apply man's reason, that is to criticize and investigate at all, there it is not only unprofitable but anti-social to believe.

Whether you range yourself with James or with Pearson will probably in the end depend on irrational but deep-seated preferences of your nature which you must respect, but which you could hardly justify in thoroughly objective terms.

Though opinion is necessary in life, it does not follow that all our prejudices are sound. Many prejudices are boorish, provincial, and illiberal, and fly in the face of fact and of a decent regard for one's fellows. Prejudice may express itself in a dogged unwillingness to see what is right before our eyes. For such stubbornness there is no defense. Because most of our life must be lived in terms of probability and hypothesis, we cannot conclude that one guess is as good as another. The situation, in fact, is just the reverse; just because hypothesis plays so important a part in life, one guess is *not* as good as another, and it becomes the part of wisdom to test our opinions whenever we can. But when action is required whether knowledge is available or not, and the grounds for favoring one decision over another are obscure, we must frequently fall back on our preferences, though always at our own risk.

The development of specialized bodies of knowledge and opinion

In every culture the advantages of the division of labor lead to a considerable specialization of effort, so that dis-

distinct professions are developed, each with its own particular accumulation of data, tools, practices, and attitudes. In the more complex cultures the number of these distinct groups is very large, and each profession controls a fairly independent body of knowledge and opinion, related, of course, to the common stock but departing from it in many particulars. So it is, for example, among ourselves—the occupations and activities having a fairly complex body of traditions behind them, and making use of at least a moderately intricate aggregate of specialized data, would probably number high in the hundreds, if not in the thousands. Every one of these groups is to some extent a closed corporation, in that not everyone is eligible for entrance without some previous preparation, and in but few instances is the outsider in a favorable position to understand or appreciate either the ideals or the activities of the group. And yet in many ways he may be forced to deal with these specialized groups, or be expected to have opinions regarding their purposes and behaviors. How many of us possess the knowledge and informed appreciations necessary to deal adequately with problems connected with coal miners, chiropractors, cannery workers, bankers, actors, lumberjacks, railroad mail clerks, librarians, professional criminals, opera singers? And yet the exigencies of our political and social life may require us to form opinions about these and many other groups.

The more complex a culture becomes, then, the greater the dependence of its members upon opinion.³ More and more of life must be lived in terms of symbols and catchwords, or what Lippmann calls *stereotypes*—standardized pictures of objects and processes arrived at independently of actual observation. The situation prohibits our having first-hand experience of more than a few of the things respecting which we are every day required to form judgments. As a result definition often precedes experience, instead of growing out of it. This is a necessary feature of human development under the most favorable circumstances, since we are born immature and helpless into a world that our culture has already categorized, so that the greater part of

education is given over to the learning and acceptance of the prevailing categories; but in a complex culture many of the phenomena with which men must deal are so large—are spread over so much space and time—that no one person is ever in a position to view them in one complete perspective. This is the case even with the leaders of opinion in many matters of great political and social importance. The information they lack is sometimes available in the group, but the conditions under which decisions must be made may preclude its use.*

It often happens that our stereotypes support one another in such a way as to form a pseudo-environment more congenial to our prejudices and wishes than the actualities they replace. So long as the stereotypes endure we are defended against uncertainty and the possibility of attack. It is even possible in extreme instances for a human being to spend all of his days within the protected confines of an unreal world, and rare indeed is the man who does not entertain the most bizarre notions regarding whole groups of persons with whom he has never become intimately acquainted. Thus workingmen form ridiculous pictures of Capital, capitalists treasure horrified notions of Bolshevists, and the Negroes, the Japanese, the Catholics, the Religious Liberals, the Fundamentalists, the Prohibitionists, the Liquor Interests are regarded by misinformed people as mysterious and potent entities in no whit different from the bogey man of little children. In the resultant general frenzy much often happens which tends to make these groups what they are supposed to be.

Finally, there are nearly always persons who are directly interested in shaping our ideas or in keeping them vague

* Thus it proved practically impossible for the diplomatic representatives of the Great Powers at the Peace Conference following the Great War to make much use of the information their expert advisors on economic, political, social, legal, and other topics could have furnished them. The statesmen who made the decisions were often thoroughly ignorant of important facts bearing on the problems they attempted to settle. When the question of the disposition of the former Grand Duchy of Teschen came before him, Lloyd George is reported to have inquired, "But where is Teschen?" Similarly George Creel, who was head of our publicity and propaganda efforts during the war, admitted (perhaps playfully) that he had thought that the Ukraine was a musical instrument.

and removed from the facts. The great development of censorship and propaganda during the war was only an official extension of one of the major arts of peace—that of providing publicity, directing opinion, and canalizing interest and expenditure. People sometimes wonder how certain manufacturers can afford to advertise so extensively; but it must be remembered that a successful advertising campaign costs the manufacturer nothing, and even adds to his profits. It is the consumer who pays for the advertising, and he pays whenever he smokes a cigarette or eats his breakfast food or buys an automobile. The buyer urgently needs information regarding the goods upon which he spends his money, but it can hardly be claimed that he gets what he needs from the modern advertisement, which must therefore be put down as an almost complete social waste except when regarded as imaginative literature.

But the manufacture of opinion by interested parties occurs in other places than in advertisements, which are now regarded by many business men as a rather clumsy device for developing interests, attitudes, and patronage. "Publicity" is cheaper and more effective, even in its present crude forms, and it promises to work wonders in affecting behavior when its methods have been more highly perfected. The technique is simple enough; accounts tending to establish the attitudes or views to be disseminated are carefully prepared, and are then as unobtrusively as possible introduced into the regular mediums from which the public is in the habit of obtaining information—into newspapers, magazines, books, moving pictures, schools, the radio, churches, women's clubs, etc.—so that the desired views may be absorbed and acted upon without acquaintance with their source. The data released need not be false, nor need they be totally unrelated to the purposes for which they are employed. The chief contemporary users of publicity methods are politicians and moving picture notables.

The newspaper no solution of the problem

The newspaper in its contemporary forms is incapable of providing more than a tithe of the information currently

needed for intelligent participation in the affairs of a complex society. There are at least three reasons for this fact, connected respectively with what we expect of a newspaper, with the nature of the newspaper business, and with the nature of the information required for a workable understanding of contemporary affairs.

We expect a newspaper to present us with a rapid and easily digested survey of the events of the day. This means that no time can be lost in putting the news into our hands; that the processes of verification must be brief and summary; that emphasis must be placed on crude and easily observed acts, rather than on more subtle interplays; that the unusual, the catastrophic, and the interesting must be preferred to the unobtrusively important; that the material must be arranged for extremely rapid perusal, and trivial events of contemporary interest be placed more prominently than far more significant happenings in which readers do not feel themselves so intimately concerned. To state the matter briefly, the modern newspaper is almost forced by its readers to become a mere institutionalization of gossip.

That so many newspapers perform their functions as well even as they do under the existing handicaps is a great tribute to the profession. It is significant, however, that but few new journals of the nonsensational type succeed in establishing themselves in the larger cities nowadays, and that many of the older papers have been forced to discontinue or to consolidate. Those which still carry on do so by virtue of an established clientele or an old tradition, or through the introduction of quasi magazine features (columnists, cartoonists, rotogravures, advice to the love-lorn, and the like). The irresponsible yellow press constitutes a great force working to perpetuate ignorance, prejudice, and hysteria in public life. Thus during a recent subway strike in New York City after an unimportant accident in which trains were held up for a few minutes and several people slightly bruised, a number of newspapers of this type appeared with headlines like the following:

FIRST SUBWAY WRECK AND VIOLENCE

It should always be remembered that running a newspaper is a business, and that it is therefore necessary to make both ends meet. Curiously enough, however, it is a business in which an ostensible by-product furnishes most of the revenue, since newspapers usually cost more to manufacture than the price at which they are sold, and advertisers furnish most of the income. The circulation must be maintained so that the paper will make a satisfactory advertising medium. There seems to be almost no out and out dictation of policy, and but little direct coloring of the news (though it is not entirely absent, as a study of the reporting of events in which great department stores are involved would clearly show); the primary influence of the advertiser is indirect and has little to do with his own private welfare, but it is none the less pervasively important. From the financial point of view a newspaper might almost be defined as a device for putting advertisements before the public eye by placing them next to more interesting reading matter. In this respect our newspapers are a little like the old-time peddlers who visited people's houses and related the gossip of the region while they displayed their knickknacks.

But even if our expectations were more rational and if the financial problem were solved, there would still remain the enormous difficulty of obtaining and disseminating the kinds of data which are required for an informed attitude regarding questions of public policy. Certainly newspapers cannot be expected to maintain large research staffs, and yet it is often only through prolonged investigation that even meager light can be thrown upon social problems. By the time the necessary information is available, if indeed it can be unearthed at all, the situation has often so greatly changed that the old data are useless except for purposes of historical record. Further, it is frequently almost impossible to present the highly technical results of expert investigation into contemporary social questions in such a form as to make them available to the citizen of average intelligence and training, so that one may legitimately wonder whether it

will ever be an important function of the newspaper to inform people regarding these matters. Newspaper readers are seldom equipped to form sensible opinions on any of the questions of the day, whether these questions deal with internal affairs or with international relations, and newspapers can do but little to prepare their readers for an intelligent understanding of them.

The bearing of these facts upon the future of democracy

Considerations of this kind are leading many thoughtful men to revise their notions of democracy. Thus after a penetrating analysis of the whole problem in his two books entitled *Public Opinion* and *The Phantom Public*, Lippmann is forced to conclude that the democratic omniscient public is a myth, and must remain so. Democracy to be effective must submit to a drastic self-denying ordinance. The people must recognize their own great limitations, and must redefine in more modest terms the relations between themselves and their representatives and public servants, in such a way as to give their officers greater power while at the same time making them more severely amenable to popular control in certain specific directions. The concrete results of Lippmann's analysis are as follows:⁴

1. Executive action is not for the public. The public acts only by aligning itself as the partisan of some one in a position to act executively.
2. The intrinsic merits of a question are not for the public. The public intervenes from the outside upon the work of the insiders.
3. The anticipation, the analysis and the solution of a question are not for the public. The public's judgment rests on a small sample of the facts at issue.
4. The specific, technical, intimate criteria required in the handling of a question are not for the public. The public's criteria are generalized for many problems; they turn essentially on procedure and the overt, external forms of behavior.
5. What is left for the public is a judgment as to whether the actors in the controversy are following a settled rule of be-

havior or their own arbitrary desires. This judgment must be made by sampling an external aspect of the behavior of the insiders.

6. In order that this sampling shall be pertinent, it is necessary to discover criteria, suitable to the nature of public opinion, which can be relied upon to distinguish between reasonable and arbitrary behavior.
7. For the purposes of social action, reasonable behavior is conduct which follows a settled course whether in making a rule, in enforcing it or in amending it.

Put briefly, the public must place its trust in experts, but must keep its eye on them to make sure they act according to established rule. When a difficulty arises, instead of attempting to settle the question ourselves we should try to agree upon someone whom we can trust to settle it for us; and then we should hold this individual (or group of individuals) responsible, not so much for his decision as for his manner of reaching it.

This brilliant proposal is obviously open to the criticism that only a highly intelligent person might be expected to act in the manner suggested; and the public is as unintelligent as it is uninformed. Also the public is lazy, and it might be more trouble to find out what the experts were doing, even if a vigilant and efficient information staff furnished the necessary data, than to translate one's prejudices into a series of crosses on a ballot on election day. At the same time, realistic analyses of this type are a thousand times to be preferred to a complacent acceptance of the existing situation with its tacit assumption of an impossibly informed voter. Certainly men of light and leading should no longer allow themselves to lend credence to the myth of the thoroughly competent citizen, and should turn, as their powers permit, to the problem of making democracy more effective under the conditions which actually exist.

Innovation and discovery in social life

It has been pointed out that every culture depends for its daily existence upon an unobtrusive body of matter-of-fact; that there grows up parallel to common sense and extending

beyond it a body of interpretation or opinion; that extensive specializations of knowledge and opinion are also found in every culture; that problems of the understanding and appreciation of these esoteric disciplines arise; and that these problems become particularly important and aggravating with respect to matters of public policy in a complex culture like our own. The discussion now turns to another general feature of social life—to the elements of novelty exhibited therein.

In a certain somewhat philosophic sense even our most stereotyped gestures must be credited with novelty, for, however often they may be repeated, it is clear that they are never carried out twice in exactly the same spatiotemporal setting. It is also hardly probable that exactly the same stimulus should ever make a second appearance, or that precisely the same reflex arcs should swing into action in just the same manner for a second time; for the former possibility is contrary to the law of action and reaction in physics and the latter to the law of habit in psychology.

Even if one leaves the more subtle levels of analysis, however, a survey of the available facts also leads to the conviction that small though perceptible alterations of response are extremely common in human experience. Thus the typist who will write the same sentence a half dozen times and then examine the product closely will not fail to notice slight deviations in the spacing and blackness of the letters from one writing to the next; while self-observation during the course of the writing will also reveal other variations in this rather simple activity. In addition the typist may be able to point to certain similarities running through all his copy when it is compared to that of other persons. Most of these slight similarities and differences from one response to the next are of no great significance in our lives, though under special conditions they may easily become crucially important, as when a forger is caught because he copied a single signature too closely. The slight variations of response also add considerable zest and uncertainty to human experience.

Variations of social significance are not totally different in kind from these smaller and more trivial individual differ-

ences in response, as a close study of the solution of simple mechanical puzzles under controlled conditions is sufficient to demonstrate.⁵ After a certain amount of random manipulation and the following of suggested leads ("trial and error"), it often happens that the parts of the puzzle suddenly fall apart. In many instances the subject is still unaware of the specific operations which yielded the solution, and further practice is nearly always necessary before the puzzle can be handled smoothly and easily. The adaptive response need not differ from the unsuccessful efforts either in its manner of origin or in its feeling quality while it is being tried out; it just simply happens to be the response which fits the objective situation.

These remarks apply strictly and absolutely to even the greatest discoveries, which are to be distinguished from lesser adaptations and innovations not by virtue of their origins, but on account of their significance. True enough, these discoveries are not made by just anyone, but the psychological conditions of their appearance seem to differ in no way from those characteristic of less important innovations. They appear in the same humble and casual manner as their more trivial brothers, but they happen to be of greater importance when considered in the light of the prevailing attitudes and needs. From the point of view of social importance, two types of discovery may be somewhat arbitrarily distinguished, as follows:

(1) *The addition of single items to the social heritage.* The man who isolates a new chemical element or states a more exact value for the atomic weight of one that is already known, who excavates the site of an ancient city or rewrites its history in the light of new evidence, who breeds a hardier species of wheat, devises a more effective test for hiring street car conductors, writes a good detective story, concocts a satisfactory tooth paste, provides a more durable grade of window glass, or gives utterance to a novel figure of speech, has undeniably added to the social heritage. Something which was not previously known or appreciated, or which could not previously be done, as a result of his efforts or good fortune now exists to enlarge or supplement the culture

pattern. Not every such change need be for the good and happiness of the group; a man may invent a siege gun which can throw a projectile an additional mile or two, or give currency to ideas or facts which are destructive of morale or good living. It is, of course, also possible to alter the social heritage by disproving or discrediting commonly accepted though erroneous notions, even though no constructive proposals are offered in their place.

(2) *The development of genuine new principles, tools, or methods.* From these there result either entirely new culture patterns or extensive realignments of those already existing. New leads or directions are given to human thought and activity, so that men are required to set foot on untraveled roads leading they know not where. Examples are to be found in such innovations as the discovery of radioactivity, the development of analytical geometry, the invention of logarithms, the discovery of the New World, the germ theory of disease, the invention of printing from movable type, of oil painting, lenses, moving pictures, gunpowder, the novel, the factory, the newspaper, the purchase of commodities on the installment plan, etc. Nearly all of the discoveries discussed in the latter part of Chapter X might also very properly have been included under this heading. It should be clear that the new principles, tools, or methods need not benefit the social order or otherwise enlarge the sphere of man's well-being.

How discoveries are made

In the paragraphs that follow an attempt is made to discuss some of the more general features of the process by which discoveries of the first importance are made. The aim is to gain a clearer notion of the relations obtaining between the genius and his social environment, so that the extent to which they mutually coöperate during the process of discovery may be better appreciated. In reading these paragraphs the reader should not fail to remind himself of the data bearing on this point which have already been presented in earlier chapters.

A study of numerous discoveries and inventions of the

first importance leads one to the following conclusions regarding the manner in which such discoveries are made:

(1) They always depend very closely upon an already existing situation. They are never pure figments of the imagination or absolute creations *de novo*, but instead make use of available materials and rest firmly on previously attained discoveries and arrangements. Only in mythology do creatures of the mind spring into being fullgrown and without antecedents; here on earth every brain-child has two parents, of which one is the mind in which it is born and the other is the fertilizing social situation. This will be found to be the case whether one is interested in the leading idea or principle involved in a great discovery, the materials employed in realizing this principle, the mechanical devices utilized in the attainment of the desired end, the tools and apparatus necessary to provide the materials in the requisite forms, or the uses to which the discovery is put when it is finally achieved. Thus James Watt in inventing his steam engine did not originate the principle of using the expansive power of steam to do work; he did not begin at the very beginning and decide from what materials a steam engine should be built, nor what its general structure should be, nor just how each part of the engine actually constructed should be built; nor did he settle beforehand the entire possible range of its uses. He began with Newcomen's engine and sought to improve it, and, being led on from one thing to another by his own genius and the needs of the situation, over a long term of years put forth the great series of inventions for which we honor his name. At every point the progress of his work was helped or hindered by considerations extrinsic to his genius, as when difficulty was experienced in obtaining the kind of cylinders which his engine required.

(2) Even great discoveries are usually extraordinarily simple. They often consist in no more than viewing already existing items in a slightly different perspective. This is nicely illustrated by Watt's first device for securing a rotary motion from the back and forth movement of the piston of his engine. This invention was pirated from him when

he failed to secure a patent on it because he regarded it as already common property. Regarding his device Watt remarked:⁶

The true inventor of the crank rotative motion was the man who first contrived the common foot-lathe; applying it to the engine was like taking a knife to cut cheese which had been made to cut bread.

And yet it was not until 1780 after steam engines had been in actual use for seventy-five years, that this mechanism was transferred from the lathe to the steam engine.

Often a problem is all but solved when the right question has been asked; but the existing devices and arrangements may for a long time hinder even talented men from approaching nature with questions having fruitful answers. Thus in the case just mentioned it seems unlikely that the rotary motion device could have been applied profitably to Newcomen's engine without otherwise altering it, since Newcomen's apparatus was designed throughout for pumping water from mines rather than for use in industry. A number of inventions will often be interdependent, so that each requires the existence of the others if it is to prove successful. Improvements in weaving cloth (Kay's flying shuttle, 1738) led to improvements in spinning thread (Arkwright's water-frame, 1769; Hargreaves' spinning jenny, 1770; Crompton's mule, 1770), these required further improvements in weaving (Cartwright's power loom, 1785), and the increased demand for raw cotton encouraged Whitney to invent the cotton gin (1793).

Descartes's invention of analytical geometry offers a stunning example of the simplicity of many great discoveries. It had long been a matter almost of common knowledge that the position of a point on a plane is determined when its relation to two known points has been established. In this manner the ancients calculated the position of ships at sea by measuring the angles they made with the two ends of a line of known length, using a well-known trigonometrical principle in the operation (a triangle is known when one side and the adjacent angles are given). Descartes did

nothing more than apply this fact to the description of the path of a point, that path being referred in a fixed manner to two intersecting lines (coördinates), but as a result it became possible to give algebraic equivalents for geometrical figures and a whole new field of mathematical endeavor was opened up. The calculus follows from analytical geometry as a natural corollary, although the fact that the simple step forward was not taken for over a generation indicates the presence of forces working against the new development. That these forces must have been chiefly cultural is one of the burdens of our argument.

(3) The actual conditions under which discoveries are made are often extremely casual. The great discoveries in this respect seem remarkably like the thoughts which are every moment flitting through our minds. As often as not they intruded themselves upon the discoverer when he was not expecting them. The investigator must learn to seize upon his half thoughts and his daydreams, and must devise means of recording these items in their first flight, if they seem to be of value, or he will lose much of inestimable worth. Examples have already been given in earlier chapters of the casual conditions under which discoveries of great importance have been made, but the following quotation from a work by the English anthropologist, W. H. R. Rivers, may be cited as furnishing a somewhat unusual case of what after all is a fairly common phenomenon:⁷

For many years I have been the habitual subject of an experience in which, as soon as I become aware that I am awake, I find that I am thinking, and have for some time been thinking, over some problem, usually in connection with the scientific work upon which I am at the time engaged. Many of the scientific ideas which I value most, as well as the language in which they are expressed, have come to me in this half-sleeping, half-waking state directly continuous with definite sleep.

The having of new ideas, that is to say, depends to only a slight extent (if at all) upon conscious individual control of one's mental processes. Control over mind is to be

achieved largely through control over the environment, through the provision of devices for eliciting certain ideas and inhibiting others, for recording suggestions as they arise, for making them accessible to other persons, and for criticizing them according to approved canons which are themselves not immune from criticism.

(4) The most important psychological factors making for discovery are interest and "the ripe mind." Men have often discovered things for which they were not looking, as we have seen, but they have seldom if ever made important discoveries except in connection with matters of deep concern to them. It is necessary to *live* with a problem before it begins to disclose its possibilities and relationships. The inventive, investigative mind must be very thoroughly seeped in its materials, and it is probably impossible to achieve this status without solidly founded emotional attachments to one's work. This is probably the basis for whatever slight amount of truth may be contained in the comfortable adage that "Genius is the capacity for taking infinite pains." What appears very much like drudgery from the outside, however, and would certainly require painstaking application for even mediocre mastery on the part of another, may really be joyous and exhilarating play to the man whose whole heart is in his work.

(5) Two or more persons often make the same, or very nearly the same, discovery independently and at almost the same time. Ogburn's list of these independent discoveries of the same thing contains a surprising number of items, although it is clearly incomplete.⁸ To name but a few cases out of the hundreds that are known: Newton and Leibniz independently invented the calculus; Bessemer and Kelly the means of purifying cast iron by blowing air through it; Edison and Swan the electric light; Lister and Pasteur independently arrived at the connection between dirt and putrefaction; Darwin and Wallace while working in isolation developed the theory of evolution by means of natural selection and the survival of the fittest. This last instance is extremely interesting, for it reveals some of the social mechanisms at work. Both investigators agreed that they

had been helped to the formulation of the theory through a reading of Malthus's famous essay on the principle of population, which deals with the connection between the growth of population and the food supply, and happens at one point to make use of the phrase "the struggle for existence." To both Darwin and Wallace this phrase was luminous with meaning when they chanced upon it, and it was the occasion of leading them independently to essentially the same solution of the problem of evolution.

The evidence is therefore strong that important inventions and discoveries are a function of the time as well as of the individual. Certain ideas fit easily and fruitfully into the prevailing conceptions, and therefore may almost be counted upon to make their appearance, whereas other notions which may perhaps be equally sound have little chance of seeming reasonable, since they cut across all the established ways of thinking. Even unpopular notions are seldom if ever developed in complete independence of a tradition, for upon inspection they are found to rest either upon the prevailing ideas or upon a minority tradition. It is not necessary, of course, to believe that all inventions and discoveries are directly and intimately related to the social heritage, for some leeway must be left for the operations of mere chance; but the dependence beyond question exists in all but a very small number of cases.

(6) Discoveries of great importance often lie fallow for a considerable time. Unless a man's work accords fairly well with the prevailing spirit of his time and place, it is hardly likely that it will be favorably noticed. From this point of view it is just as embarrassing to be ahead of one's age as behind it, just as unsatisfactory to be right as wrong. Appreciation and recognition may come with the lapse of time, but there is always an excellent chance that one's work will be buried forever, and that some future investigator will be forced to go over much the same ground at a more propitious time.

Perhaps the most interesting resurrection of long ignored work is that of Mendel's highly original researches into plant hybridization, which were published in 1866 and re-

mained hidden away in an obscure publication until the spring of 1900, when they were almost simultaneously resuscitated by De Vries, Correns, and Tschermak, who had independently conducted researches of a very similar character. Since then Mendel's investigations have become the basis of modern biology. His investigations were ignored, we may be sure, not because they appeared in an obscure source, for they must have been glanced at by scores of biologists in the thirty years following their publication, but because they were not in accord with the prevailing trends in biology.

On all sides, then, we are compelled to recognize the influence of the culture pattern in determining the course of invention and discovery. The existing social forms, embedded to various degrees and in various relations in the minds of individual members of the group, according to their personal experiences, are acted upon by the interests and other affective urges of the individual—themselves also almost entirely social creations—and slowly submit to change. Most of these changes are extremely small, and are of general cultural significance only when summed, but a very few establish new leads and set men working in novel directions. These are the great discoveries and inventions. Important as they are, however, they occur according to precisely the same mechanisms as determine lesser changes.

REFERENCES

- ¹ William James, *The Will to Believe, and other essays in popular philosophy* (N. Y., Longmans, Green, 1896), 1-31.
- ² Karl Pearson, *The Grammar of Science, Part I—Physical* (3 ed., London, Black, 1911), 59.
- ³ Cf. Walter Lippmann, *Public Opinion* (N. Y., Harcourt, Brace, 1922), esp. Parts I-III.
- ⁴ Walter Lippmann, *The Phantom Public* (N. Y., Harcourt, Brace, 1925), 144-145.
- ⁵ H. A. Ruger, The Psychology of Efficiency, An experimental study of the processes involved in the solution of mechanical puzzles and the acquisition of skill in their manipulation. *Archives of Psych.*, No. 15 (N. Y., Science Press, 1910).
- ⁶ A. P. M. Fleming and H. J. Brocklehurst, *A History of Engineering* (London, Black, 1915), 128.
- ⁷ W. H. R. Rivers, *Conflict and Dream* (N. Y., Harcourt, Brace, 1923), 7.
- ⁸ W. F. Ogburn, *Social Change, With respect to culture and original nature* (N. Y., Huebsch, 1922), 90-102.

PART IV
CONTEMPORARY WAYS OF LIFE

Chapter XIV

CONTEMPORARY ECONOMIC LIFE

Purpose of this Part

It may be well, before attention shifts to a new phase of our subject, to survey the ground already covered. Our analysis began by tracing the consequences of the fact that human beings are biological organisms living in close dependence on a culture pattern. Our own culture system—western civilization—was then summarily described and placed in relation to other cultures. Into this social world we are born, and by it we are shaped in the course of our growth to maturity. The ways of our group lead us to fall into its characteristic routines, to become acquainted with its simple tools and to be influenced by its more complex mechanical apparatus, to gain a working knowledge of the idioms of its language and its store of thought patterns, to become indoctrinated with its everyday techniques, opinions and values, and perhaps to reach the point of criticizing or changing the existing arrangements and conceptions.

In the discussion of routines, tools, language, values, common sense, and innovation, attention centered on a few of the more general aspects of the total culture complex. Our relations to our culture can also be studied, however, from the institutional point of view—through an analytical survey, that is to say, of the institutions or social forms in which (and through which) we live. A thorough analysis of all existing institutions is beyond the scope of this book, but in this and the following chapters contemporary economic institutions, the family, art, science, and religion will be discussed, since they are among the more representative and significant of contemporary social patterns. The primary aim will be to view these great organizations of human aspiration and effort not so much in their general and cosmic perspectives as in relation to the life of today.

Basic factors in economic life

Economic life centers around the existence of needs and desires for commodities and services which, though attainable, are scarce and are not under the control of the persons who would like to have them. Lacking these things and wanting them, human beings are led to offer other things in exchange, and an economic transaction is thus initiated. The following features, accordingly, are fundamental to even the simplest economic situation:

(1) *Existence of economic goods*—desired items which are not to be had for the asking. Daisies in an open field where all are free to come and pick have no economic value, be they ever so beautiful; while the most worthless gew-gaw is an economic good if people would like to have it and cannot get it for nothing. Daisies which have been brought into a city, where they are not grown, will have economic value if the people who live there would like to have them, and are willing to give something in exchange. Commodities which are needed or desired but which are not scarce are not economic goods (*e.g.*, the air we breathe or the light from the sun); nor are commodities economic goods if they are scarce but undesired (as the only existing autograph of a nobody, or the last rose of summer); but anything which is both scarce and wanted is of economic importance, whether it be of genuine value or not (as the song of a grand opera tenor, the skill of a physician, a favorable location for a store, or the ability to entice people to buy fake oil stocks).

(2) Some form of *differential advantage*, involving control or ownership of an economic good. One person must have what another person lacks; the economic goods mentioned in the preceding paragraph rest in the hands of specific individuals, who stand in a position of economic advantage because they possess them. This advantage may be of any kind. A thing may be possessed, a service controlled, a valuable process monopolized, prestige be guaranteed, or customers' habits formed; one may be first in the field, near to the market, far from competitors, close to the raw materials, or otherwise favorably placed—if only for some

reason a differential advantage exists favoring those who are in a position to provide the desired good.

The term differential advantage covers a somewhat wider field than the concept of private property, since nothing need actually be owned where an economic advantage exists. Of two boys selling peanuts on the street, one may hold an advantage over the other because he stands where people must pass, although he does not *own* the right to stand there—he simply happens to be there rather than somewhere else. All cases of private ownership of course confer an economic advantage, but not all differential advantages are owned.

We sometimes hear “the principle of private property” spoken of as if ownership or control always occurred according to a single well-defined rule. A precise enumeration of the privileges and obligations of ownership or control in any given instance usually depends, however, upon the close analysis of a fairly large number of customs and conventions.¹ Ownership of a toothbrush confers different economic and legal privileges than ownership of stock in a railroad, as do the conditions under which an inventor controls his patent rights, a plumber his services, a landlord his apartment house, a mine-owner his coal mine, a partner in a corporation the policies of the concern, a banker the money he has loaned, an author the royalties on his books, a railroad its right to carry passengers, a lawyer his fees, or a wife a share in the income of her husband.

Some restrictions upon the activity of certain people in favor of others with respect to things that are scarce, however, must exist before economic life can make its appearance. The differential advantage, it should be clear, need not consist in the control of material things; it may arise because you are physically able to do certain things that I cannot, but that I should nevertheless like to have done—or I may even be able to do these things, but may prefer to have others do them for me, as when I employ some one to cut the lawn.

(3) *Division of labor.* Economic transactions cannot take place when all men are engaged in the same tasks. This

is one of the fallacies involved in the old remark that the women of the Channel Islands make their living by taking in one another's washing. For trade to occur, the traders must each have something that the others want; and this means that they cannot have the same things. There must be some degree of differentiation and at least the beginnings of specialization in men's pursuits before economic relations can occur. But the importance of a fairly complex division of labor as a basis for civilized life has already been discussed.

(4) *Exchange*.² It is also obvious that something must be given for something in all economic transactions. Gift-giving acquires an economic significance only when the necessity of an interchange is recognized, as it is among many primitive peoples, where much trading goes on under the guise of the giving and receiving of presents.

Exchange is never carried very far before it involves the use of *money*—of some commodity which, because of its ready exchangeability, is accepted by the members of a group with little regard to their present consumption needs or the economic status of the person who offers it. We accept money tokens so readily because they constitute a medium of exchange—that is to say, because everyone else is also ready to accept them for their products—and anything of which this is true by that fact becomes money, whether it be cattle or bars of metal or coins or pieces of paper. The tokens used need have no value apart from their monetary uses, if only they continue to be exchangeable. In this respect, however, money tokens are like all economic goods.

(5) *Standard of living*. Behind all economic transactions, finally, there stand certain consumption habits or accredited ways of utilizing material goods and services. Thus in our culture, although we eat the flesh of many animals, we do not wittingly consume that of horses and dogs, although these animals are highly regarded as food by other peoples. Certain things are desired, while other things which may be just as good for the purpose are ignored or treated with contempt. Within every culture, as a matter of fact, there usually exist not one but several standards of living, each

functioning as an economic ideal of a social class. Many of the economic problems faced by the members of every culture arise from the effort to live according to the conventional requirements of their class. It is a little like belonging to a club—every member of the group is expected to spend a certain amount to maintain the standards of the organization. This is true even of the very poor; they must do what the others do, and spend what the others spend, or they are looked upon as skinflints, or pitied as being less well off than their fellows.

A classic description of the most important standard of living in our own culture is to be found in Veblen's *The Theory of the Leisure Class*.³ It must not be thought, however, that the phenomenon of an accredited standard of consumption is peculiar to western civilization. It occurs in aggravated form, for example, among the Indians of the Pacific Northwest in the institution known as the potlatch, which is a feast or celebration in which expensive presents are given to the guests and much property destroyed. Those who have been honored in this fashion can regain their lost prestige only by giving a yet more extravagant potlatch, in which the gifts they have received are returned with interest.⁴ But we do not need to go far afield for examples of the influence of standards of living upon men's lives, since nearly all of our desires and not a few of our needs were developed in the light of conventional standards as to what is fitting for persons in our station.

Our inheritance of economic ideas from the past

The precise forms taken by the features named above as basic to economic life clearly depend in large measure upon the other items in the specific culture complexes to which they belong. The existing economic arrangements always gain a good part of their validity and stability from their connections with the other aspects of the culture pattern. Thus it is not written in the nature of things, apart from the estimates appropriate to a given culture pattern, that so many units of one commodity shall exchange for so many units of another. Some little investigation into

social history is nearly always necessary for a satisfactory explanation of even the more concrete aspects of the existing economic situation—for an understanding, for example: of the knowledges concerning the location and production of the raw materials that are employed by the culture; of the techniques for their transformation into the desired finished products; of the standard estimates of their worth; of the customary modes of distributing the results of economic enterprise; etc.

But every culture also inherits from the past certain rather philosophical notions which are important because they enter into and affect the economic operations of the group. The characteristic economic activities are not engaged in without comment or interpretation, but theories and explanations are woven about them, and these opinions often secure such currency as considerably to influence the actual economic interchanges. Now it happens in our culture that most of our generally accepted views about the nature of economic life date from the eighteenth century, from a time prior to the great industrial changes which have so greatly altered the world we live in, so that in many respects these notions fail to take adequate account of the conditions actually prevailing at the present time. Some of these ideas were no doubt of material assistance in helping to bring the new era into being, though they reveal obvious deficiencies when applied to the interpretation of existing situations, and are now recognized by many competent investigators to be out of accord with the facts. In spite of their inadequacies and inaccuracies, however, these notions are still strongly endorsed by many men and are passively accepted by many others, so that it becomes more than a matter of mere historical interest to know precisely what they are. In the paragraphs that follow, therefore, three or four of these ideas will be briefly discussed.

(1) *The idea of the economic man.*⁵ This conception was clearly and unequivocally stated by the classical economists. Thus Adam Smith, the founder of modern economic science, states that the motive which sways men in their economic relations is

their universal, continual, and uninterrupted effort to better their own condition. It is this effort . . . which has maintained the progress of England towards opulence and improvement . . . [The desire to better our condition is one] which, though, generally calm and dispassionate, comes with us from the womb, and never leaves us till we go into the grave.

In this view Malthus also concurs, for he states that

to the laws of property and marriage, and to the apparently narrow principle of self-interest which prompts each individual to exert himself in bettering his condition, we are indebted for all the noblest exertions of human genius, for every thing that distinguishes the civilised from the savage state.

If self-interest is the great principle upon which economic life is based, it is natural to believe, as did John Stuart Mill, and with him all the respectable political economists and business men, that

a person of sane mind, and of the age at which persons are legally competent to conduct their own concerns, must be presumed to be a sufficient guardian of his pecuniary interests.

Men, in other words, are of such a nature that, given a choice between the more profitable and the less, they may be counted on to choose the former and reject the latter.

(2) *The principle of competition.* The conviction that men are highly rational economic beings always pursuing their own private interests did not lead the classical economists to the conclusion that economic endeavor should be strictly controlled, for it was accompanied by the conviction that the good of the whole society was equal to the sum of the private goods of its members. Although

it is not from the benevolence of the butcher, the brewer, or the baker, that we expect our dinner, but from their regard to their own interest, . . . every individual necessarily labours to render the annual revenue of the society as great as he can. He generally, indeed, neither intends to promote the public interest, nor knows how much he is promoting it. By preferring the support of domestic to that of foreign industry, he

intends only his own security; and by directing that industry in such a manner as its produce may be of the greatest value, he intends only his own gain, and he is in this, as in many other cases, led by an invisible hand to promote an end which was no part of his intention . . . [The study by every individual of his own advantage] naturally, or rather necessarily leads him to prefer that employment which is most advantageous to the society.⁶

Every individual, therefore, should be permitted to engage in whatever occupation he sees fit, under conditions which he himself determines, and the open competition of the market should be allowed to decide who shall survive and who shall go to the wall—for this decision is bound to be the one which is most advantageous to society as a whole. This arrangement commended itself to economists and to business men alike as “the obvious and simple system of natural liberty.”

It is not surprising that men who believed so strongly in the virtues of competition were opposed to all combinations among workmen. Smith refers to them as “outrageous combinations,” and disapproves of them in no measured terms.⁷ Mill, with his strong social sympathies, offered no *a priori* objection to the formation of labor unions, although he did not believe that their efforts would be either effectual or desirable, for if laborers combined and

aimed at obtaining actually higher wages than the rate fixed by demand and supply—the rate which distributes the whole circulating capital of the country among the entire working population—this could only be accomplished by keeping a part of their number permanently out of employment.⁸

(3) *The principle of laissez-faire.* It follows as an obvious corollary of the above positions that government should not interfere with business. Smith holds that all state interference with industry, either to restrict or to encourage competition, is “as impertinent as it is oppressive,”⁹ and he is firmly convinced that governmental meddling can only make a bad situation worse. A famine, for instance, “has never arisen from any other cause but the violence of government attempting, by improper means, to remedy

the inconvenience of a dearth.”¹⁰ The sovereign has but three duties to perform—to provide defense, to guarantee justice, and to maintain public works.

Although the general trend of Adam Smith's system was optimistic (he wrote on “the wealth of nations”), the classical economists were soon led by their logic to disturbing conclusions. Their principles forced them to believe that all economic misery is inevitable—unless, indeed, it had been created gratuitously by the stupid efforts of government to interfere with the natural laws which worked as relentlessly in the sphere of economics as in the realm of physics. Among these laws were the principle of population (enunciated by Malthus), which stated that population must always press closely upon the available food supply (unless men should refrain from having children), and that war, disease, misery, and vice are therefore inevitable phenomena; the wage-fund theory, with its sister doctrine, the iron law of wages, which state respectively that at any given time there is only so much money available for wages, and that the wages of labor must always tend to approximate the bare minimum necessary to ensure subsistence and the reproduction of further laborers; and the law of rent, which enunciates the principle that the time must come when “almost the whole produce of the country, after paying the laborers, will be the property of the owners of land and the receivers of tithes and taxes,”¹¹ although according to the theory these individuals were precisely the persons who were producing nothing. It is not surprising that economics became known as “the dismal science” (Carlyle); and (as we have seen) it was from a reading of Malthus's essay that Darwin and Wallace independently framed the concept of the struggle for existence as explanatory of the course of evolutionary development.*

* Malthus himself saw in the whole matter an illustration of the Divine beneficence and foresight. “We cannot but conceive that it is an object of the Creator, that the earth should be replenished; and it appears to me clear, that this could not be effected without a tendency in population to increase faster than food; and as, with the present law of increase, the peopling of the earth does not proceed very rapidly, we have undoubtedly some reason to believe, that this law is not too powerful for its apparent object.”¹²

(4) *The doctrine of natural rights.* Behind the economic theory that we have been describing stands the conviction that men as individuals are endowed with certain inalienable rights received direct from nature, and subject to abrogation by the state only through a usurpation of power. Some of these rights were social and political rather than economic, but it was generally recognized (as it still is today by most people) that men are inherently entitled to certain economic privileges in relative independence of their manner of using them. Among these "immutable" privileges were: the rights of property, summed up in the phrase "A man may do what he will with his own," and involving the right to administer, to bequeath, and to inherit without external interference; and the rights of contract, or the privilege of buying and selling goods and services on the open market, without interference or pressure from those not directly concerned in the transaction.

Attacks upon eighteenth century economic principles

Although the economic philosophy described in the preceding section is still accepted in its essentials by the great majority of contemporary business men, and by many other persons in positions of power and influence, its validity has been severely attacked at nearly every point with the passing of the years. Today the eighteenth century notions stand in serious need of revision or replacement by some more satisfactory set of principles. Their weaknesses will be discussed under three headings, as follows:

(1) *The pressure of economic facts.* The Industrial Revolution was not long under way before it became abundantly clear to many people that the men, women, and children who labored in the mines and factories were not their own masters, as economic theory required; that in many instances they were helplessly bound to their work; and that the conditions under which their employers, urged by private interest and the pressure of competition, were impelled to make them labor were not conducive to the general welfare of the state. Thus one employer, who in 1792 received high praise for his humanity, and who must therefore have been exceptionally

considerate, was actually employing children of from five to eight years of age from six in the morning to seven at night.¹³ In 1802 England passed the first Factory Act, limiting the labor of parish apprentices in cotton factories to twelve hours a day, and in the years following 1819 the alarming conditions in industry led to the placing of a whole series of Factory Acts on the statute books. These interferences of government with industry were not the by-products of theorizing, but sprang from obvious practical necessities. The biological and social havoc created by the early Industrial Revolution was beyond gainsaying, although the political economists and the business men held that the unwholesome conditions were inevitable, and prophesied disaster to the state should the government venture to act contrary to nature's fixed economic laws.

Political opportunism has many times been forced to ignore the warnings of the economists since the early days of the Industrial Revolution, so that in all countries affected by the factory system and the machine process there exist laws prescribing the hours and conditions of labor. During the Great War, government interference with industry was carried further than ever before. In order to carry on their war operations successfully, the Great Powers were compelled to reorganize and control nearly all of the industrial operations located within their borders. Munitions, transportation, fuel, food, clothing, and many other minor productive enterprises were placed under government control and management of the strictest sort. The war experience, however, was not necessary to demonstrate the need for a large measure of government regulation in industry, and at the present time but few economic activities are carried on outside the jurisdiction of the state. Government and industry are more and more interpenetrating, not by way of "interference," but as a result of the development of functions and the interlacing of needs. Government is less and less regarded as the mere sovereign right to rule, and becomes instead a great public service corporation; while the wider bearings and significance for the public welfare of the economic activities carried on within the state are receiving in-

creasing recognition. In a complexly interdependent world like our own, every economic enterprise becomes invested with public interest.¹⁴

(2) *Changed views of human nature.* Classical political economy was based on the assumption that men are highly rational creatures, keenly aware of their own interests, and gifted with the power of determining how best to realize them. Modern psychology, whatever else it may be, is overwhelmingly nonintellectualistic, and students of human nature are therefore forced to conclude that the economic man is a myth. All sorts of motives, of varying degrees of rationality, enter into and affect the actions of human beings, so that behavior which is genuinely based upon self-interest is much rarer than people are likely to think. Men are not reasoning machines whose lives are entirely given over to the sober, selfish calculation of the comparative advantages of one course of action as against another. They are creatures of impulse, of bias, of habit, of feeling, of strange silly hopes and idle fears, fond of escaping from the unwelcome present in dreams of a more pleasant future, willing to follow their ideals as though they were real existences, often moving heaven and earth for mere baubles while remaining inert before the appeal of things of genuine worth. The sum of all these little private chaoses under a régime of *laissez-faire* could only have been one great glorious superabounding confusion, were there no external ordering principle, more efficacious than the pious conviction of the political economists that social welfare was a mere matter of the addition of units of individual selfishness.

(3) *Changed views of society.* Fortunately for social peace and stability, there is such a principle of order, although the classical political economists were prevented from seeing it by their ideas respecting the nature of society. They regarded society as the result of the coming together, under the terms of a mythical social contract, of a number of distinct, autonomous, self-sufficient individuals, who were keenly aware of the rights given up and the privileges gained by their entrance into social relations with one another. A contract was held to be necessary to account for social

relations, in much the same way as a manufacturer might require a contract before shipping an order to a customer. Almost no contemporary students accept this view of the origins of society. They regard social relations as much more inescapable and fundamental than the social contract view assumed, and at the same time they look upon particular social arrangements as slow historical growths rather than as rational contractual adjustments. Human beings are regarded as social throughout, and it is taken as a matter of fact that social institutions interpenetrate and mutually affect each other at every point. Rights are seen to be socially derived, and therefore dependent on the pleasure of the group, rather than the gift of the Creator as an inalienable part of a man's native equipment.

An inspection of our economic life lends strong support to the contemporary view. At no time has *laissez-faire* meant complete governmental noninterference with business. Believers in the eighteenth century doctrines have always held it to be one of the functions of government to protect business and property rights, so that the business men and economists who advocate the policy of hands-off are really favoring one form of control as against another.

Penetrating and conditioning industrial activity at every point there is a tangled web of legal, political and social institutions. Among the legal institutions are the prohibition of physical violence in industrial activity, a recognition of private property rights, machinery for compelling the discharge of obligations voluntarily assumed, and prescribed forms for partnerships and corporations. Among the social institutions are a system of intangible and immaterial property rights, the manifestations of public and class opinions, a code of business ethics, and a system of collective action and the recognition of collective authority in individual industrial establishments. Upon these the advocate of *laissez faire* of necessity takes an attitude. Since these institutions change slowly and are conceived of as indispensable, they have generally been regarded by the business man as a part of the unchangeable nature of things. Therefore *laissez faire* formally says nothing about them. Yet its very silence is the best

evidence of its unqualified approval of habitual legal and social institutions and its demand that the individual be hedged about with conventional authority.¹⁵

Society is held together through the interfunctioning of social institutions and through their molding effects on the individuals composing the group, rather than through the rationality and contractual force of its arrangements. We are all stamped with very much the same patterns—the patterns, namely, of our group—and it is not strange that our views should so closely correspond. The advocates of *laissez-faire* who felt that they were stating nature's immutable economic laws were simply announcing their adherence to certain of the conventional patterns of their culture. The following story, told by the English anthropologist, Rivers, may help to establish the fact that even our most generally accepted and apparently rational attitudes regarding economic institutions may nevertheless be conventions:¹⁶

I was travelling on a boat with four inhabitants of Niue or Savage Island, and took the opportunity of inquiring into their social organization. At the end of the sitting they said they would like now to examine me about my customs, and, using my own concrete methods, one of the first questions was directed to discover what I should do with a sovereign if I earned one. In response to my somewhat lame answers, they asked me point-blank whether I should share it with my parents and brothers and sisters. When I replied that I would not usually, and certainly not necessarily do so, and that it was not our general custom, they found my reply so amusing that it was long before they left off laughing. Their attitude towards my individualism was of exactly the same order as that which we adopt towards such a custom as the *couvade*, in which the man goes to bed when his wife has a child, and revealed the presence of a communistic sentiment of a deeply seated kind.

The conviction that nearly all of our economic attitudes are conventions does not destroy the validity of our economic institutions—only a person who still retained the rationalistic view of society could reach such a conclusion from these premises. It should help, however, to make us feel more

readily disposed to see these institutions changed, if this at any time should seem to be desirable, than if we regarded them as the product of immutable natural laws with which it is folly to interfere. The way is always open for the serious and realistic consideration of other alternatives.*

Features of contemporary industrialism

In this section some of the more objective features of our own economic life will be described, and then in the following section contemporary economic activities will be analyzed with a view to determining their constituent processes. Thereafter some of the chief criticisms of the existing order will be indicated and a few general proposals for amelioration suggested; after which the chapter will be concluded with a consideration of the more important criteria of a satisfactory industrial system.

When our complex industrial civilization is compared with the economic systems of other times, the following phenomena stand out clearly as characteristic:

(1) *High degree of mechanization.*¹⁷ Not only do we use more machinery than any previous culture; our life is built upon and centers around the machine. Our goods are produced in factories, where the machines are housed; the operations of manufacture have been severely standardized according to the requirements of the machine process, as respects the raw materials which are used and the activities (both of the workmen and of the mechanical parts) by which these materials are worked up into the finished product; the manufactured goods themselves bear the stamp of the machine in the substantial identity of each specimen with every other; and even the arrangements under which many staple commodities are marketed are frequently determined by the requirements of the machine process, in that the goods are first produced and then sold as best they may be. The factory system, large-scale production, highly specialized tasks

* By a realistic consideration is meant one which attempts to take account both of the facts and of the prevailing attitudes; which refuses to deal with hopes which are not also possibilities; but which does not discard possibilities merely because they are not as yet actualities.

complexly and intricately dividing the process of manufacture, thoroughly standardized products, big selling campaigns, the search for markets, an extreme degree of economic interdependence—all these are corollaries of our extensive use of machinery.

The effects of our dependence on machines extend far beyond our economic life. The members of our culture have been molded throughout by the pressures peculiar to an industrial civilization. In our world everything occurs according to a strict schedule; we have precisely divided the day into tiny parts, in terms of which we expect ourselves and others to function; we carefully plan itineraries for our vacation trips, and route ourselves through Europe somewhat as a piece of metal is routed through a manufacturing plant; we make "efficiency" our ideal (forgetting that efficiency is not necessarily synonymous with the good life); we measure all things in quantitative terms, and equate size or quantity with excellence; we too easily allow ourselves to disparage the past, since we are convinced that a lack of mechanical apparatus must involve a paucity of all good things; and in divers other fashions we show that we have become indoctrinated with the standards of the machine process.

(2) *Capitalism*. Hobson has given a clear statement of the meaning of "capital" among business men in the following terms: ¹⁸

Capital consists of all forms of marketable matter which embody labour. Land or nature is excluded except for improvements: human powers are excluded as not being matter: commodities in the hands of consumers are excluded because they are no longer marketable. Thus the actual concrete forms of capital are the raw materials of production, including the finished stage of shop goods; and the plant and implements used in the several processes of industry, including the monetary implements of exchange. Concrete business capital is composed of these and of nothing but these.

Of these items two will be singled out for special discussion—the money value of the plant and equipment used in pro-

duction, and the financial devices employed in operating industrial enterprises; for it is around these matters that the characteristic development which we have called capitalism centers.

The money value of the apparatus used in modern industry far surpasses that of any previous period. Thus Macdonald writing in 1911 about conditions in England, states: ¹⁹

The textile operative used to employ tools equivalent in price to but a few months of his labour, whilst in modern times there is a capital in plant of about £200 for each man, woman and child in a textile factory. The cost of a steamship is equivalent to the price of the labour for ten years of those who work her, whilst the railway servants operate capital valued at perhaps twenty years of their wages. In 1845 M'Culloch estimated that the fixed capital in good cotton mills was no more than equal to two years' wages of an operative; Marshall's figures work out at five years' wages.

In 1919 in the United States, the average capital employed per wage earner in all manufactures was \$4,898, while the average wage paid was \$1,157.²⁰ The average American factory worker in 1919 used capital worth a little over four years' wages. Interest on plant and equipment, together with provision for depreciation and replacement, constitute a large and growing charge upon modern industry. Although the worker's income has increased in recent decades, the amount of capital investment per worker has also increased, and at a greater rate.

Still more significantly, however, does contemporary business enterprise center around the financial operations which have developed in connection with the growth of modern industry.²¹ No industrial operations of any consequence today are run upon a cash basis. Nearly everything is bought and sold upon credit; raw materials and finished products alike are paid for in promises to pay at a future date rather than in ready cash which is handed over at the moment of sale. Similarly, goods are contracted for long before they are needed, and delivery is guaranteed of prod-

ucts which have yet to be manufactured, often before the raw materials from which they are to be made have been obtained. Practically all industrial operations going on at any given moment, that is to say, depend to a greater degree than ever before upon events which are expected to happen in the future. It is not strange that they are often invested with uncertainty. As a result, business concerns as a part of the normal course of their industrial operations are in recurrent need of ready money in various sums for various short periods of time, while at other times they have a larger supply of ready cash than they can use in the immediate future. Sometimes they have insufficient reserves to meet their maturing obligations, while again they are in control of cash which must lie idle, so far as their own operations are concerned. It is in such contingencies as these that bankers function by lending money to some concerns and borrowing from others, so that obligations can be met and temporary reserves be put to use. And so a complex series of financial operations has been grafted on to the productive processes of industry, until modern economic activity has become an almost inextricable maze of productive operations and financial manipulations.

The discounting of bills and the making of advances constitute, however, only a part of the big banker's business. He also functions increasingly as the promoter of industrial enterprises. As his business grows, he gains control of resources which he does not like to see lying idle. In addition to his own growing reserves, he has the use of the small savings which other persons are glad to place in his hands in return for a steady rate of interest. And, on the other hand, there are always businesses (or projected businesses) which cannot establish themselves for lack of money or credit. The persons in control of these enterprises are eager to have the banker join with them in return for his financial support. His support may be given either through the direct loan of money, or through help in marketing shares of stock in the business. If stock is issued, matters are usually arranged so that the buyers of the stock purchase merely a financial interest in the concern, actual control

of its policies being concentrated in a small board of directors responsible largely to the banker promoter.

This situation opens up the possibility of two fairly distinct courses of action. The business can be operated so as to yield a profitable return upon the stock that has been issued; or the project can be manipulated to yield a return through the sale or purchase of the stock itself. Both operations from the banker's point of view are primarily financial rather than industrial; that is to say, they revolve principally around questions of investment rather than questions of production, around money considerations rather than technological problems.

Modern industrial operations are called capitalistic because they are operated so largely upon this basis. It is not enough that a certain product be manufactured and sold at a price which will bring in a reasonable profit upon the plant and equipment actually required to maintain the industry; the directors must also see to it that a suitable return is available, not merely upon the *capital* actually invested in the industry, but upon the amount for which the industry is *capitalized*—i.e., upon the amount of stock issued when the company was organized. Thus a banker in financing a given business might provide \$1,000,000 to start it off, and in return issue stock whose par value was \$2,000,000 of which half might be sold to the public to reimburse the banker for his investment, while the rest remains in his hands and those of his associates. Under these circumstances, although the actual investment in the industry was \$1,000,000 (this too having really been obtained from the general public through the sale of stock), dividends must be paid on stock valued at \$2,000,000. With a technologically sound idea, even such conditions need not prove impossible; but if it seems likely that more can be realized by up-and-down manipulations of the selling price of the stock, so that it can be bought when cheap and sold when dear, this may be attempted; or, if it seems feasible, the company can be reorganized from time to time, new stock being issued and distributed or sold. In this manner purely financial considerations often become more important in the business

world than considerations of productive efficiency or social welfare.

(3) *World markets.* Modern industrialism draws upon all parts of the world both for its raw materials and for the sale of its finished products. Few sections of the globe are today so isolated as to lie outside the single great buying and selling area of our economic life. A single individual in the course of a normal day's life comes into direct contact with materials drawn from the four quarters of the earth. Tribute is levied on the tropics and the polar regions alike for commodities basic to contemporary life, and the natural products of the sea, the deserts, the great tundra regions, and the mountain fastnesses are requisitioned for our daily needs. And in return the goods that we manufacture are sent to all peoples everywhere, so that the wandering Arab rides his camel with a European rifle slung by his side, the Eskimo regales himself with our gumdrops, the South Sea Islander wears calicoes from Lancashire, the Bantu negro a high silk hat, the Carib smokes a corn-cob pipe, and the sun never sets on the Ford car.

Even the great increases in population in the western world since the middle of the eighteenth century—Willcox estimates that the population of Europe was about 130 million in 1750 and about 400 million in 1900, with about 100 million persons of European origin or descent living outside of Europe²²—have been insufficient to absorb the greatly increased productivity of the machine process, and the manufacturers of the western world have been forced to look outside its borders for markets. One of the great problems many manufacturers of today have to face is that of disposing of the goods they are capable of producing. Supply rather than demand has become the structural and determining fact in our economic life. This accounts for the recent great development of advertising. People must be enticed into buying, demand must be created, desires awakened, wants manufactured, to correspond with the goods that are ceaselessly produced.

The need for wider markets is also one of the chief factors behind modern imperialism, or the effort on the part of

powerful nations to control weaker peoples. An even more potent economic factor, however, is the need of the great financial potentates for enlarged investment areas. The home market can absorb neither the goods that are produced nor the capital reserves that are created, and so strong forces working for political expansion are released. Many features of American policy within the last few decades with respect to South America, Central America (including the Panama Canal episode), Mexico, the West Indies, the Philippines, and the Far East generally can be explained only on this basis. Great banking houses have made large investments in these areas (or are anxious to do so), and they wish to have their interests protected. In our world, at least, the flag follows trade just as often as trade follows the flag.

The effects of imperialism extend beyond the mere control of "backward" and undeveloped regions by powerful western states as "spheres of influence" and fields for markets or investment. International rivalries such as those which stood behind the Great War are engendered. It was largely because of competition for the control of Morocco by French and German investors, rivalry between Austrian and Russian interests in the Balkans, and mutual antagonism between German and English imperialists, that the western world was recently bathed in blood. The foreign policies of the Great Powers were effectively determined by considerations relating to sources of raw materials, markets for finished products, fields for the investment of capital, etc., rather than by a regard for the general welfare and mutual advantage of all parties concerned.

(4) *Rise of new economic classes—bourgeoisie and proletariat.* One of the major features of modern economic life is the progressive consolidation and emergence into self-consciousness of two great social classes—the *bourgeoisie* or middle class and the *proletariat* or working class. Neither of these groups was created by the Industrial Revolution, but under the conditions of the modern order they have assumed an importance comparable to that of kings and nobles, landlords, priests, slaves, serfs, guildsmen, and warriors in previous régimes.

The bourgeoisie of today are lineal economic descendants of the nobles, landlords, officials, and bankers who derived a living from commerce during the Middle Ages.²³ At the present time the class may be taken to include the owners and managers of economic enterprises, bankers, merchants and the owners of the larger stores, professional men, as well as many clerks, salesmen, foremen, small proprietors, etc. Being a bourgeois is really a state of mind rather than a precisely defined status, although membership in the class commonly involves at least a minimum of economic independence, a certain amount of social prestige or rank, clean hands, and the rudiments of gentility. It is not easy to determine just how many persons in our society belong to the bourgeoisie, although the title "middle class" is clearly a misnomer, since but a very small percentage of the population attains the level requisite for entrance into the group. Thus in 1919 the 10,812,736 persons engaged in manufacturing operations in the United States were divided as follows:²⁴

9,096,372	wage earners
1,033,507	salesmen, clerks, etc.
281,253	superintendents, managers, etc.
132,467	corporation officers
269,137	proprietors

It is unlikely that more than 10 per cent of the persons enumerated can have belonged to the bourgeoisie, even if the rich owners are counted as members. Of course these figures cover only a slice of the total population—persons engaged in manufacturing operations—and no doubt are not completely representative of the whole of our society. Essentially the same result, however, is obtained from a survey of incomes for 1918 made by the National Bureau of Economic Research. In that year only 14 per cent of American incomes were over \$2000, and the average income was around \$1100. The average family income a year later was \$1513, well below the decent minimum for health and comfort.²⁵

The proletariat class of modern times also had its rise in

the period preceding the Industrial Revolution. It was created largely as a result of changed agricultural conditions which made large-scale farming or sheep grazing profitable. These operations required fewer hands than the older medieval agriculture, so that increasing numbers of unskilled laborers controlling nothing of economic significance but their power to work were released to drift into the cities where they furnished the human raw material for the factory system when that began to develop. This movement marked both the decline of the old-fashioned independent farmer in favor of the large-scale agricultural enterpriser, and the disappearance of the old-fashioned artisan and craftsman in favor of the new industrial proletariat.

Laborers are employed today in nearly all industries according to "the wage system," wherein certain units of labor are hired rather than men, although the men naturally have to deliver in their own persons the labor they sell. The principal tie which binds them to their work is the wage that they receive, and they exercise little or no control over either the tasks at which they are set or the products which they help to manufacture. The workmen can usually be discharged at any moment without notice; and on their own part they tend to shift from one job to another, so that the problem of labor turnover is serious in many industries. As the economic system has become more thoroughly stabilized, the old opportunity to rise from the ranks has increasingly diminished, until the hope of a broadening economic future has lost much of its former power to keep the workman satisfied, although it is often still possible by hard work and stern denial for a family to raise the social status of one or two of its children.

Members both of the bourgeoisie and of the proletariat are today usually at least dimly aware of their class affiliations. No sentimental feeling of brotherhood binds each group together, it is true, but when members of the one class are thrown into close contact with members of the other psychological strains and differences can usually be detected. The two groups really mix very little, in spite of the fact that they often partake of very much the same amusements

and participate to a large degree in economic enterprises where they are every day brought into close contact. Inter-marriage between the two classes occurs only infrequently, and then usually only as respects persons on the border-line between the two groups.

(5) *Great social and psychological changes.* Changes of this character are so numerous and so important that it has been necessary to refer to some of them in connection with the discussion of other topics; and in the chapters that follow yet other human effects of our economic order will be indicated. In a way the socio-psychological effects of industrialism form the chief theme of this book, since it would hardly be possible to discuss man and culture in their contemporary interrelations without devoting a large amount of space to the widespread effects of our economic system on human nature. At no other period, perhaps, have the basic economic arrangements under which men have lived been so influential in determining the culture patterns of the group on the one hand, and the psychological patterns of individual behavior on the other.

The tremendous population changes which have featured the last century and a half of western history surpass in magnitude even the great barbarian invasions which overthrew the Roman Empire and laid the basis for the modern world. These changes are three-fold: great increases in the total population of all regions affected by the Industrial Revolution; large shifts of population to new regions, a phenomenon which had its beginnings in the previous period, but during the last century reached unprecedented heights; and the exuberant growth of cities, so that today the rural regions can scarcely hold their own in absolute numbers, much less in percentages of the total population. These changes have been accompanied by the accentuation of problems of poverty, disease, crime, unemployment, overwork, overcrowding, and discontent—phenomena certainly not created by our industrial order, although they appear therein in new magnitudes and relationships.

All these social changes have been correlated with psychological developments, so that no phase of our private life

has escaped being influenced by the new order of things. Our habits, our standards, our ideals, our attitudes and expectancies, our interests and aversions, our affiliations, tastes, recreations—every aspect of life has been touched. Consider, for example, how the “practical man” in the following description differs from the saint, the warrior, the gentleman, the scholar, the troubadour, of other days: ²⁶

In this country the great prizes are not found in Congress, in literature, in law, in medicine, but in industry. . . . The social reward of business prosperity, in power, praise and luxury, are so great as to entice men of the highest intellectual faculties. Men of splendid abilities find in the career of a manufacturer or merchant an opportunity for the most intense energy. . . . In this fierce though voiceless contest a peculiar type of manhood is developed, characterised by vitality, energy, concentration, skill in combining numerous forces for an end, and great foresight into the consequences of social events. If the character is further analyzed we discover, along with some apparent heedlessness of pain and many compromises with conscience, an integrity about contracts which makes it possible to build the business of the world on credit. Those who live in retirement and simplicity are apt to find the swift, brusque, imperious and impatient manners of the successful man somewhat severe and offensively dictatorial. But the ceremonial tediousness of the parlor would be out of place in the office of one who must think rapidly enough to keep thousands of telegraph operators, stenographers, clerks and other employés in occupation. Dainty speech and elaborate politeness under the conditions of life in a great commercial house would have all the effects of crime.

Analysis of contemporary economic activity

The preceding discussion was mainly descriptive, but it raises certain problems which can perhaps be seen in clearer relief after a brief analytic survey of contemporary economic activity. The following paragraphs attempt to answer the question—what general features of distinct economic importance characterize the process whereby a given commodity (as a breakfast food, a cigarette, a pair of shoes,

or an automobile) enters into our life? At least five fairly distinct economic phases of this process can be named:

(1) *Production*—all of the operations whereby the raw materials, the machinery and plant, the labor (including the necessary technical abilities), the power, and all other similar items are brought together in one place and applied to each other in such a way as to yield the desired product. These matters can be grouped under one heading, because under contemporary conditions they all tend to become technological or engineering questions; that is to say, their effective and proper solution depends upon techniques and knowledges such as one might learn at an engineering school which also maintained courses in industrial psychology and in economic geography.

(2) *Finding a market*—all of the operations having for an aim the securing of customers for the finished product. Here we may include everything that might have been avoided if the customer without solicitation had requested the manufacturer to deliver the commodity to him direct. The principal items are selling costs (especially cost of retailing) and advertising. Under contemporary conditions the cost of marketing most products runs very high; in the case of a popular brand of breakfast food twenty-six cents on the dollar goes to the retailer, while the cost of advertising consumes eleven cents on the dollar. The farmer who raises the basic product receives a little over sixteen cents out of each dollar spent by the consumer.

(3) *Consumption*—all the operations whereby the finished product is utilized after it reaches the ultimate consumer. Although these activities are seldom written about from the economic point of view, except as regards the industrial consumption of goods (as steel girders in constructing buildings, or coal in running engines),* they are manifestly of the greatest economic importance. Few arts for the individual consumption of goods have been developed in our society to as high a level as have the techniques of production. The average consumer is woefully ignorant

* Operations which are usually and quite properly spoken of as production, since their purpose is the creation of further utilities.

respecting the goods he buys. Few businesses could hope to endure if they purchased their raw materials as haphazardly as the average family. Cooking and the purchase of household commodities are in an extremely backward state so far as most households are concerned, and few persons are adepts at the homely arts of living.

(4) *Price operations.* If a naïve man were asked what the purpose of industry was, he would probably reply, "To make goods." He would be wrong, for the primary aim even of strictly industrial operations is usually the directing of the flow of goods in such a manner as to extract the maximum of profits. That such tactics are often extremely necessary under contemporary conditions can be easily realized from the following incident:²⁷

The valorization of Brazilian coffee (1908-1914) illustrates the way in which world-wide scope is given to control of prices. There a big crop threatened (1908-1909), by unprofitably low prices, to bankrupt a country's main industry, if not to provoke political revolution. To avoid these, a banking syndicate bought 8,000,000 bags of coffee in one season to hold for sales to be spread equally over a period of several years following. The result was that, aided by smaller crops, for most of this selling period prices rose from eight to twelve and fourteen cents a pound.

The directors of a corporation are, as a matter of fact, legally obligated to manage the business for the exclusive benefit of the stockholders, and they are not permitted to limit dividends on considerations of public welfare.²⁸ There need be little or no relation between the prices at which commodities are sold and the actual costs of production, since the general rule is to "charge what the traffic will bear." Goods are even sold on certain occasions for less than their cost of production, as during rate and price wars, for advertising purposes, or in order to dispose of surpluses (for which reason it sometimes happens that exactly the same commodity can be obtained more cheaply in a foreign market than at home). Sometimes essentially the same product is sold in the same market under two or more names

at different prices so as to tap a number of different levels of purchase.

(5) *Financial operations*—all operations having for their aim the realization of profit through the purchase and sale of shares in an economic enterprise. These activities have already been discussed in a preceding section, so that it need only be pointed out here that the value of a business does not lie in its physical and productive assets, or in its social utility, or even in its actual earning capacity, but rather in what money can be realized from it; and that by skillful financial manipulation it is not seldom possible so to jockey values as to gain large profits without rendering productive equivalents. It therefore happens that operations carried on in terms of stocks, bonds, and other papers take a foremost place in contemporary large-scale industrial life.

The whole contemporary situation is summarized in the following quotation:²⁹

We have, then, uninformed investors dependent on financial interests for opportunities to invest; a consuming public dependent on corporations for the goods of life, while these corporations aim to perfect arrangements which will enable them to fix prices in a way to realize the largest profits; these corporations, in turn, dependent for loans on financial interests which also are seeking primarily private profits; and workmen dependent on these industrial and financial interests for an opportunity to work—a condition of general dependence that gives the leaders great power.

Criticisms of industrialism and proposals for change

The present economic order has not suffered for lack of criticism during the few generations of its existence. Few people would not be willing to admit that the contemporary arrangements are faulty at one point or another: and many have fired heavy broadsides at the whole system.³⁰ The concrete proposals for alteration are also numerous, and include such diverse suggestions as the following: (1) the institution of complete competitive individualism, in place of the somewhat mitigated individualism of the present

arrangement; (2) collective bargaining between formal organizations representing employers and workers (trades unions and employers organizations); (3) the development of coöperative business units, owned and controlled by those who participate in them (including coöperative stores, co-partnership schemes, etc.); (4) nationalization (public ownership of industries basic to the group life, such as the railroads and the coal mines; (5) state socialism, or public ownership and control of all industrial enterprises; (6) syndicalism, or ownership and control of each industry by the workers therein; (7) guild socialism, or public ownership of all industries joined with their economic management by the workers combined into guilds according to industries, under the political sovereignty of a parliament representing all consumers; (8) anarchism, or the complete abolition of all involuntary associations, and especially the state. A variety of proposals have been put forth under each of these headings, and it is obvious that some of these suggestions are not inconsistent with others—in particular (for example) collective bargaining, coöperation, and nationalization might all be successfully applied at the same time.

Is industrialism necessary? ³¹

In dealing with plans for economic reorganization, it is advisable that we keep clearly before us the considerations developed in the last section of the chapter on values, pp. 260-62. Every proposal for change must be inspected to see if it actually takes its start from the existing arrangements, "not as immutable and unchangeable, but as present and real," and it must in addition be required to specify the precise instruments which are to be depended on to transform things as they are into things as they might be. Let us with these considerations in mind turn to the existing economic order, and see what we may legitimately expect of it.

In the first place, it may be taken as axiomatic that no plan for economic reorganization is seriously worth considering which does not involve at least as great a use of machinery as does the present scheme. Whether we like it or not,

our culture must stand or fall with the machine—if the machine goes, we go too. There would be no surer way for western civilization to commit suicide than for it to renounce machinery, were so foolish an act possible. We must direct our efforts to determining what manner of good life is possible with at least our existing mechanical apparatus, and probably with much more machinery than we now have.

This at once raises the question whether men have it in their power to make machines their slaves. Is there anything about a machine which requires it to be master or nothing in the lives of men? Is it absolutely inevitable that a society which uses machinery shall itself be completely mechanized? It certainly seems paradoxical that men by securing control over nature's power resources and raw materials should themselves become enmeshed in their apparatus of control.

Whether man can obtain control over the machine depends on whether industry on its productive and on its business sides can be treated as tools are (*cf.* Chapter X); or put more broadly, it is a question whether these activities can become genuine *arts*—for every art rests upon the effective use of certain tools in the attainment of humanly satisfying ends (*cf.* Chapter XVI). The question can be answered affirmatively only if: (1) control over the machinery of our life for productive and social purposes should happen to be (or could be made to be) humanly satisfying on noncommercial grounds; (2) forces should happen to exist whereby the existing arrangements might give way to those which are desired.

(1) *The attractiveness of noncommercial incentives in industry.* But little investigation is required to demonstrate that the motives governing the participation of many people in economic life are not primarily connected with the garnering of profits. They may be compelled to keep strictly economic considerations in mind at every point, but these considerations are regarded as natural obstacles to be overcome rather than as the ground and basis of all their endeavors. Thus when an industrial chemist attempts to develop a better electric light filament, he knows that his

invention must be commercially feasible, but he does not invariably look upon this as the end-all and be-all of his activities. Douglas, after giving many examples of the play of nonbusiness motives in the lives of applied scientists, captains of industry, and manual workers, concludes as follows:³²

The evidence seems irrefutable that alongside the economic motive, which is undoubtedly real and powerful, there are in most of us these noncommercial incentives as well, which are, at present, utilized only to a small fraction of their capacity. It is one of the problems of our social life to offer these desires an opportunity to function for the common good and to stimulate them in that direction. The false conception of the exclusively economic man had blinded us to these other characteristics of mankind and has helped to make our age one where the emphasis is laid upon acquisition. But if we know that there are these other sources of energy in men, we can then more confidently apply ourselves to the creation of devices and attitudes which will call them forth.

It may be said that Douglas deals largely with exceptional cases, and that his conclusions therefore need not apply to the rank and file of owners and workers. Analysis of the behavior of more ordinary people, however, supports the view that their economic activities are also affected by non-commercial motives, although the whole push of our industrial system is largely in the opposite direction.

(a) Few people are really in economic life today because of the prospects of economic success. The overwhelming majority of men work for a living, and not for the big prizes accruing to the few who reach the top. Most men work to live, and not for the sake of profits. They would work just as much (or as little) under quite different conditions. Ambition may drive men forward for a time when they first enter business life, but its dull futility in all but exceptional cases soon becomes apparent. The whole apparatus of business and finance could be amputated from our society, and the lives of most people would not be visibly affected, provided only they were guaranteed jobs and wages. It is a

bitter irony that the age which defends the institution of private property on the ground that it is necessary to personal development should also be an age in which but few people own anything beyond the articles necessary to daily life. If the pull of business motives and the lure of wealth were universally essential to economic activity, our system could never exist in its present form.

(b) Inside of industry the great majority of persons actually performing technological and productive functions show signs of significant industrial interests of a purely non-monetary character. Although they work only for a living (as in the case of the great majority), or are relatively oblivious to merely economic motives (as in the case of the better-off managers, engineers, production experts, shop foremen, etc.), most men are seldom wholly deaf to considerations of productivity, good work, etc. Douglas cites a number of instances where much better work was done when the workmen were kept acquainted with the quantity, quality, and cost records they were making, although they themselves received nothing negotiable as a result of their improved efforts.³³ Few human beings are content to work ineffectively if they are acquainted with a better procedure involving about the same effort, and it seems beyond question that much of the dissatisfaction with the existing economic arrangements does not arise because they yield so little in the way of pecuniary return to so many people, but because so many of the activities they require men to engage in are productively futile and meaningless. A competitive business régime leads to much duplication of effort on the one hand, and to much hindered motion and balked activity on the other, since one of the functions of business on occasion is to restrict production. Futility is of the essence of a competitive system where more factories and more machines than are required grow up because they can, not because they are needed.

It was stated when the American Wire Nail Association was formed in 1895, that the machinery then working in the country could produce four times the quantity of nails for which

there was a demand. When the whisky combination was formed, also in America, it took over eighty plants and found it could produce up to the demand with twelve. The Sugar Trust was formed after eighteen of the forty refiners in the United States had become bankrupt. Eighteen of the survivors formed the Trust, eleven refineries were closed down, and the necessary production was carried on by seven.³⁴

It seems beyond question that the desire to see a worthy product emerge as a result of one's efforts forms just as strong a feature of human equipment as the desire to achieve large profits and a business success, and that it is only because business ideals happen to be so central to the contemporary culture pattern that they assume their present importance. They are no more inherently inevitable than any other of the thousands of different motives that have swayed the members of other cultures in times past. The whole matter is, first and last, a question of socially generated attitudes and habits of thought.

The idea that industrialism is something inevitable in a community which uses coal and iron and machinery, so far from being truth, is itself a product of the perversion of mind which industrialism produces. . . . The essence of industrialism, in short, is not any particular method of industry, but a particular estimate of the importance of industry, which results in its being thought the only thing that is important at all, so that it is elevated from the subordinate place which it should occupy among human interests and activities into being the standard by which all other interests and activities are judged.³⁵

We are therefore entitled to conclude, as respects our first inquiry, that there is nothing humanly impossible about action from noncommercial incentives, and that already in industry itself considerable numbers of persons either by existing conditions are forced to act noncommercially or of their own free will prefer to do so.

(2) *Forces making for the transformation of the existing economic order.* Before dealing directly with this subject, it is manifestly proper to state with all diffidence the criteria

of a good industrial system, so that the desired ideal may be held before the mind. It is, of course, essential that this ideal should be more than a mere utopia—it should be feasible in the light of present conditions, as well as desirable, for our aim here is not to write a poem or dream a dream, but to indicate a direction in which a given portion of the culture pattern might conceivably be altered. The following, therefore, appear to be among the criteria of a desirable economic system:

(a) *Productivity*. Here the existing system at first glance appears at its best, although it is difficult to make precise comparisons with other cultures, since the effort and labor required merely to maintain the economic structure cannot be counted in its favor.

We compare the quantity of cloth turned out in a modern cotton mill with the quantity which could be turned out by the same number of laborers using the spinning wheel and the hand loom, forgetting the labor which has gone into the construction of the mill and its equipment and the fact that a large part of the labor required for the production of cloth is employed on the plantation, where the increase of productive power has been comparatively slight. We compare the cost of moving a ton of freight by railway and by wagon, but we forget that owing to the growth and expansion of population and its congestion in limited areas, devoted to manufactures and trade, goods must be carried much longer distances than a century ago. We forget that the increase in productive power has not been uniform throughout the whole field of industry, that it has been greatest in manufactures, mining, and transportation, and least in agriculture and the handling of goods in trade, in which branches of industry is employed a large part of the labor required in the production of the necessities of life. Furthermore, our industrial development, accompanied as it has been by the growth of city life, has imposed upon us the necessity of providing new forms of wealth and services not required by a less densely settled population, such as paved streets, sewage systems, costly plants for supplying water, police service, and protection from fire, and has immensely increased the difficulty of providing adequate housing.

The instances of increased power of production are striking and appeal to the imagination. The offsets are not so obvious and are apt to be overlooked.³⁶

For our purposes the productivity of a society may be measured by the manner and degree to which it satisfies the biological needs of its members.* Does it furnish plenty of the right kinds of food; clothing and shelter sufficient for protection against the elements; an abundance of pure air and lots of room; the opportunity for healthy work, rest, and recreation; the proper conditions for birth, growth, and development to maturity—in short, the requisites for biological, physiological, and psychological well-being?

Irrespective of how our culture may be ranked in comparison with other cultures in these matters, it is clear that much more is possible in guaranteeing these life-necessities to every one than has yet been accomplished, even without any substantial changes in our economic institutions.

(b) *Security to its members.* We can judge an industrial system by the number of its destitute, penurious, stunted, baffled, underfed, under-educated, submerged lives. Many individuals, of course, are so constituted by nature as to become misfits under almost any conditions, but every set of economic arrangements may be expected to push a variable number of persons over the line which divides the self-maintaining from those who are liabilities to the group. In our contemporary life the number of such individuals is enormous. It is a melancholy fact that the great increases in population and rise in the general level of living during the last hundred years have probably not been accompanied by a decrease in the total number of persons living below the poverty level.

An economic system may be expected both to help men to produce healthy biological organisms, and not to lead them to produce unhealthy ones. It may be judged by the degree to which it provides security to its members, and when a single individual lives below the level of biological necessity it is no answer to point to another who has all he needs.

* It has already been pointed out in an earlier chapter that these needs differ somewhat from culture to culture; but in any event they deserve satisfaction.

In addition to the high degree of industrial insecurity that characterizes contemporary life, the political insecurity associated with war probably exists among us in greater measure than at any other time in human history. A modern war involves practically the entire population of the countries concerned, and disrupts the normal processes of living for a long period after the actual fighting has ceased.

(c) *Opportunity for personal development.* This is even less easy to measure than productivity and security, since it centers around subtler and more variable satisfactions, and passes from more strictly economic considerations over into the broadly social field. A survey, however, of the range and character of the genuinely creative endeavors going on in a society, and an analysis of the recreations patronized by its members, would be helpful in reaching a decision as to the opportunities offered for personal development, since we best express our possibilities in our creations and in our play. In neither of these fields does our culture stand especially high as compared with other cultures, although in mechanical invention and scientific endeavor we clearly surpass all previous peoples.

(d) *Flexibility.* Every proposal for social change should be required to furnish evidence that it is adaptable, that it itself can be altered as the needs of the future change. For it may be taken as an axiom that the needs of the future will be different from those of the present, and different, too, in ways that we of today are not likely to imagine. Just as every proposal should take account of things as they are, so every plan should make it possible for people in days to come to take account of things as they are then, and should therefore be so constructed as to admit of modification as conditions alter. It goes without saying, of course, that great social institutions are more frequently changed by the drift of circumstances than by conscious planning; but when proposals for change are made, it is proper to expect them to be flexible.

The above seem to be among the criteria of a good economic system. It would be foolhardy to expect the existing order—or any other—to win a perfect rating when judged by

these criteria, or by others which men might wish to apply. In conclusion, therefore, we may inquire whether the forces at work within our culture are sufficient to alter the existing arrangements, with their several defects, in the direction that has been described. There seems to be no reason for believing that the prevailing attitudes in business are so firmly entrenched as not to yield (though slowly, of course) to the pressures that are today being laid upon them. These pressures have been indicated in the course of this chapter, but it may be well to restate them here. Briefly they are as follows:

(a) *Lack of accord of existing views with well-accredited facts.* The assumptions upon which modern business tacitly or openly rests—free enterprise, natural rights, *laissez-faire*, economic self-interest, absolute ownership, etc.—are largely derived from the eighteenth century, and at the present time fail to accord satisfactorily both with conditions in economic life and with prevailing views respecting man and society.

(i) Business men are themselves finding it economically profitable, in many instances, to take their workmen into the business as co-sharers in its fortunes and co-determiners of its policies. Whether or not “a man may do what he likes with what he owns,” whether or not his workmen can be trusted to take care of themselves, wherever coöperative methods are more profitable than competitive driving, they will eventually be adopted—though not so quickly as some might think who still regard the business man as a highly rational, selfishly motivated creature.

(ii) In many instances where the interest of the individual business man would not lead to improvements in the conditions of economic life, it is nevertheless from the social point of view highly desirable, and under the complex conditions of modern life sometimes even absolutely essential, that the old order should not persist; and so we find government regulation entering more and more into the economic situation as a controlling force.

(iii) The fact that the philosophical ideas upon which business to so large an extent is based are entertained today by a decreasing number of scientific investigators is also a

force making for change. The old notions are open to continuous attack from an increasing number of persons who feel that their criticisms have behind them a body of fact and conviction every whit as respectable as that supporting the existing arrangements.

(b) *The development of the functional attitude.* In place of the old doctrine of *rights* there is slowly arising a new doctrine of *functions*. Inherent, absolute, underived rights are more and more being regarded with suspicion, and the view is gaining currency that all rights are dependent upon the performance of services, and lapse when the services are no longer forthcoming. Functionalism holds that there should be no controllers of policy or sharers in profits who do not personally contribute to the productive enterprises of the industry, and that at every point between the securing of the raw materials and the delivering of the finished product to the ultimate consumer none except those actually performing a service should be allowed to affect the processes of industrial life.

Of course such notions as these are impotent for purposes of change so long as they remain in books and in the heads of social philosophers; only to the extent that people become convinced of their truth can they become powerful. Few persons like to think that their activities are useless, much less that they are actually harmful. There is always an excellent chance, too, that the old justifications will be replaced by new ones without any alterations in the basic conditions under which men live. As a matter of fact, individuals can do but little to change the great institutions composing a culture; only large-scale pressures such as affect considerable numbers of individuals are of much influence here.

(c) *Increase in the importance of "professionalism" in industry.* This seems to be a corollary of the technological complexity of modern industrial life. So much depends on engineering operations and conceptions in all processes central to our economic life that many persons believe that the balance of power is moving (though very slowly) in the direction of professional standards and attitudes. Changes in the center of gravity of economic life are no new thing,

even in connection with industrialism. The banker did not always hold his present structural and determining position, and the time once was when there were few business men who were not technically equipped to manage and run their factories. Today, however, the specialized knowledge required to maintain production is of so recondite a nature that few business men can hope to master it; and it becomes a question whether those who possess this knowledge—the engineers, efficiency experts, personnel managers, etc.—will always continue to place it unreservedly at the service of the business man.

Two things might conceivably happen: the technical staffs and labor force of large industrial enterprises might become more important in determining the policies of these concerns than they have been in the past; and business itself might eventually approach the status of a profession, with a dignity, ideals, and standards comparable to those enjoyed by medicine, science, or the law. There is no unsurmountable reason why ordinary men going into business should not govern themselves by standards as high as those applied by ordinary men entering other lines of human activity where it has been shown that the professional spirit can exist.

REFERENCES

¹ See *Property, Its duties and rights, historically, philosophically, and religiously regarded* (2 ed., N. Y., Macmillan, 1922), esp. the essays by L. T. Hobhouse and W. M. Geldart, for a discussion of the variety of tenures under which property is held.

² Cf. C. H. Judd, *The Psychology of Social Institutions* (N. Y., Macmillan, 1926), 32-55.

³ Thorstein Veblen, *The Theory of the Leisure Class, An economic study in the evolution of institutions* (N. Y., Macmillan, 1899). This book, in addition to being a penetrating economic study, is also a great satire.

⁴ See Franz Boas, *The Social Organization and Secret Societies of the Kwakiutl Indians* (Report of the U. S. Nat. Mus. for 1895, Wash., 1897).

⁵ The quotations from Adam Smith are from Edwin Cannan's ed. of his *Inquiry into the Nature and Causes of the Wealth of Nations* (2 vols., London, Macmillan 1904; first publ., 1776), Vol. 1, 323, 327-328. The quotation from T. R. Malthus, *An Essay on the Principle of Population*, is from the last ed. revised by the author (ed. with introd. by G. T. Bettany, London, n. d.), 543. The quotation from J. S. Mill, *Principles of Political Economy, with some of their applications, to social philosophy*, is from the 6 ed. (London, Longmans, Green, 1900; first publ., 1848), Book 5, Chap. 10, Sec. 2.

⁶ Smith, Vol. 1, 16; Vol. 2, 421, 419.

⁷ Smith, Index; also Vol. I, 68-69.

⁸ Mill, Book 5, Chap. 10, Sec. 5.

⁹ Smith, Vol. I, 123.

¹⁰ Smith, Vol. 2, 27.

¹¹ David Ricardo, *Principles of Political Economy and Taxation* (first publ., 1817). McCulloch's ed., 67.

¹² Malthus, 446.

¹³ Gilbert Slater, *The Making of Modern England* (2 ed., Boston, Houghton Mifflin, n. d.), 53. This volume contains a full account of the conditions necessitating government interference in industry.

¹⁴ For a survey of the inter-relations of the state and business, see C. D. Burns, *Government and Industry* (N. Y., Oxford Univ. Press, 1921); for the functional view of the state as a public service corporation, see Leon Duguit, *Law in the Modern State*, trans. by H. J. Laski (N. Y., Holt, 1919).

¹⁵ W. H. Hamilton (ed.), *Current Economic Problems, A series of readings in the control of industrial development* (rev. ed., Univ. of Chic. Press, 1919), 45-46.

¹⁶ W. H. R. Rivers, *Social Organization* (N. Y., Knopf, 1924), 108.

¹⁷ Cf. Thorstein Veblen, *The Theory of Business Enterprise* (N. Y., Scribner's, 1904), esp. Chaps. 2 and 9.

¹⁸ J. A. Hobson, *The Evolution of Modern Capitalism, A study of machine production* (2 ed., London, Scott, 1916), 26-27.

¹⁹ J. Ramsay Macdonald, *The Socialist Movement* (Home Univ. Lib., 1911), 46.

²⁰ Ernest F. Dubrul, Economic features of the machine-tool industry, *Mech. Engineering*, Vol. 45 (1925), 151-153.

²¹ See Hobson, Chap. 9, 235-272; also Veblen.

²² W. F. Willcox, The expansion of Europe and its influence on population, in *Studies in Philosophy and Psychology by Former Students of Charles Edward Garman* (Boston, Houghton Mifflin, 1906), 41-70.

²³ See Hobson, 2-9.

²⁴ Dubrul (ref. 20 above).

²⁵ See the discussion in Tugwell, Munro, and Stryker, *American Economic Life and the means of its improvement* (2 ed., N. Y., Harcourt, Brace, 1925), 54-65.

²⁶ C. R. Henderson, in *Amer. Jour. of Sociol.*, Vol. I (1895-6), 386.

²⁷ J. F. Crowell, *Trusts and Competition* (Chic., McClurg, 1915), 117-118.

²⁸ Cf. J. M. Williams, *Principles of Social Psychology, as developed in a study of economic and social conflict* (N. Y., Knopf, 1922), 671.

²⁹ Williams, 72.

³⁰ One of the most interesting of these general indictments is R. A. Freeman, *Social Decay and Degeneration* (London, Constable, 1921); see esp. 199-203 for a long summary of charges against our economic order. Cf. also the social and political writings of Bertrand Russell, G. D. H. Cole, A. J. Pentty, Georges Sorel, Glenn Plumb, Sidney Webb, G. B. Shaw, P. A. Kropotkin, C. H. Parker, Thorstein Veblen, Stuart Chase, etc.

³¹ In connection with this section, R. H. Tawney, *The Acquisitive Society* (N. Y., Harcourt, Brace, 1921), will be found suggestive.

³² Paul H. Douglas, The reality of non-commercial incentives in economic life, in R. G. Tugwell (ed.), *The Trend of Economics* (N. Y. Knopf, 1924), 188.

³³ Douglas, 183-187.

³⁴ Macdonald, 65-66.

³⁵ Tawney, 45.

³⁶ Gardner, quoted in L. C. Marshall and L. S. Lyon, *Our Economic Organization* (N. Y., Macmillan, 1921), 225-226.

Chapter XV

THE FAMILY

Biological and sociological meanings of the term

Taken at its simplest, a family might with some propriety be defined as the group constituted when a man (or a group of men) and a woman (or a group of women) live together on terms of sexual intimacy in accordance with an established social arrangement. But such a statement really points only to the bare skeleton of the institution. The family group may also include the children and relatives of these persons, their servants and retainers, and any other persons regularly quartered with them, according to the particular status of the group in question and the patterns of the culture to which they belong; and in addition the familial relationship often persists beyond the period of biological fertility and even beyond the period when the children are developing to maturity.

The family is therefore both a biological and a sociological unit. From the biological point of view it serves to organize and stabilize sexual relations and establishes an accredited means of bringing children into the world. At the same time the family forms the most permanent and influential of all social groups. Indeed, in every culture, the sociological functions of the family best distinguish it, although it is, of course, true that there would probably be no such social group if it were not for the precise nature of our sexual urges and the need for their control and canalization. The family performs significant functions in the culture complex quite apart from the manner in which it regulates sex needs, while on the other hand few, if any, societies are without extra-familial organizations of sexual relations. In our own culture, for example, prostitution is a well-established institution. Sexual intercourse and the bearing of children take place outside of the family bond in all cultures, usually

according to thoroughly conventionalized patterns, but in every society the family forms the smallest distinct social unit—the atomic structure around which nearly all primary social activities center.

Diverse forms of the family

Probably no institution exhibits a wider variety of concrete forms, joined with the performance of such surprisingly similar functions, as does the family. There is a multitude of ways of obtaining a mate, being married, living together, joining in the different group enterprises, having children and bringing them up, annulling the relationship and breaking up the family, etc.¹ With all the diversity of arrangements, the behaviors are nearly always thoroughly institutionalized, so that certain things are proper and other things tabooed. Thus no society allows a person to choose absolutely anyone of the opposite sex as a mate, since incest restrictions always prohibit marriage with persons who are too closely related according to the canons of the group. Among many peoples where *exogamy* prevails, individuals must find their mates outside of a specified group (and perhaps inside of another specified group—just as though the Smiths could marry only among the Joneses). More precise regulations for marriage are often laid down, as when a person must espouse one of his *cross-cousins* (his father's *sister's* children or his mother's *brother's* children), or when a man's widow is inherited by his younger brother or some other near kinsman (*levirate*), to name but two extremely common marital arrangements.

It also often happens that a man is entitled to more than one wife (*polygyny*), as among the Eskimo and in some parts of Africa, although this privilege is exercised much less frequently than might be supposed; and in a few instances a woman is entitled to more than one husband (*polyandry*), as in Tibet and among the Toda of southern India. These arrangements in every case seem to depend either upon peculiar economic conditions or upon unusual distributions of the sexes, brought about by female infanticide or by an unequal sexual death-rate under the differ-

ential rigors of a severe environment. It must be pointed out that none of these marriage relationships need have unfortunate effects on the parties concerned, however they may offend our conventions. Thus Lowie writes:²

Polygyny is not by any means a sign of feminine inferiority or felt as a degradation by the women concerned. The husband may be prompted to take a second wife not by an excessive libido but by his first wife's eagerness to shift part of her household duties on other shoulders. "Why do I have to do all the work; why do you not buy another wife?" querulously asks the Kikuyu wife. In the same spirit, a Kai chief's consort will have so many social obligations to fulfill that she gladly welcomes the arrival of a helper. . . . The sexual factor pure and simple is of course not to be wholly ignored in the discussion, but everything goes to show that its influence on the development of polygyny is slight.

There are always many ways of obtaining the wife one is entitled to marry, as by exchange of sisters, the rendering of personal services, purchase, inheritance, capture from an enemy tribe, courtship, parental negotiations, the passing of certain tests,* etc. Several different ways of finding a wife are usually endorsed by the group; thus in our own culture we have marriages based on love and unions motivated by economic, political, or dynastic considerations. The esteem in which the different arrangements are held varies according to the culture pattern. Thus we prefer love matches while the Crow Indians rate higher marriage by purchase.

Among nearly all peoples marriage is looked upon as the common sequel to arrival at puberty. Celibacy is regarded as unnatural and is taken to merit either contempt or high respect. The following views are typical:⁴

So indispensable is marriage considered by the Chinese, that even the dead are married, the spirits of all males who die in infancy or in boyhood being in due time married to the spirits

* "Among the Arawak of British Guiana the prospective husband was obliged to prove his marksmanship by shooting an arrow into a woodpecker's nest from a moving boat and to give further demonstration of his mettle by clearing a field and filling a large number of crab baskets within a specified span of time." ³

of females who have been cut off at a like early age. There is a maxim by Mencius, re-echoed by the whole nation, that it is a heavy sin to have no sons, as this would doom father, mother, and the whole ancestry in the Nether-world to a pitiable existence without descendants enough to serve them properly, to worship at the ancestral tombs, to take care of the ancestral tablets, and duly to perform all rites and ceremonies connected with the departed dead. . . . The Hebrews looked upon marriage as a religious duty. According to the Shulchan Aruch, he who abstains from marrying is guilty of bloodshed, diminishes the image of God, and causes the divine presence to withdraw from Israel; hence a single man past twenty may be compelled by the court to take a wife. . . . "When a servant (of Allah) marries," said the Prophet, "verily he perfects half his religion." . . . According to the "Laws of Manu," marriage is the twelfth Sanskara, and as such a religious duty incumbent upon all. Among the Hindus of the present day a man who is not married is generally considered to be almost a useless member of the community, and is indeed looked upon as beyond the pale of nature.

At the same time few societies are without persons—priests, wizards, shamans, vestals—whose lives are devoted to chastity (or in some cases to unusual sex practices), and who are the recipients of high honor and respect from the group.

In spite of the theories of the earlier anthropologists, existing conditions both among men and the higher animals furnish no evidence that man has at any time been genuinely promiscuous in his sexual life. In every known society the relations of the sexes are regulated by definite social institutions. The arrangements usually differ from those prevailing among ourselves, and a much wider degree of sexual license is often allowed prior to marriage (and even after) than we are willing to countenance,⁵ but conditions of absolute sexual freedom are unknown among men, and are probably of infrequent occurrence among the higher animals.

The family and the organization of life activities

A large proportion of the vital activities of a culture centers around the family. It is everywhere the primary

face-to-face group. Children are born and reared in the family environment, and it is within the family circle more than anywhere else that adults are thrown into intimate contact with each other. A great deal therefore depends upon the conventional patterns and routines of family life—upon the manner in which a new family is established and upon its relations to already existing families; upon the recognized obligations to relatives, the treatment and education of the young, and the manner in which children finally leave the home; upon the economic functions of the family, including the division of labor between the sexes, the production of goods, the administration and bequeathal of property; upon the part the family plays in religious life; etc.

The mere matter of residence is of no small importance in its effects on social life. Among some peoples, as with us, the marriage mates usually set up an independent household; but in many other instances they continue to live either with the wife's or the husband's people. These three general types of residence obviously have widely different social effects, for, as the conditions attending the establishment of a new household vary, one or the other or both mates must become adapted to new surroundings. Our culture commonly requires a greater change in the woman's life than in the man's, since she usually takes a new name, a new status, and a new occupation, and in addition is conventionally expected to make most of the inevitable adaptations, while the man is still regarded as the legal and economic head of the household. Among many peoples, the husband goes to live with the wife's parents (*matrilocal residence*), and sometimes both descent and ownership are reckoned in the female line; but this does not necessarily imply feminine sovereignty, since the wife's father or the maternal uncle may be the effective ruler of the new household. The specific arrangements vary greatly from group to group, but they are invariably influential in determining how people conduct their daily lives.

Kinship usages are also important for their effects on daily life. Since these behaviors are usually taken entirely for granted by those who follow them, it is not strange that

no analysis of the ones obtaining in our own culture has ever been attempted. A special code of etiquette, varying in its provisions according to the degree of relationship, determines the privileges and obligations of persons who are akin. Among many peoples these kinship usages become amazingly specific, so that stereotyped behaviors are required with respect to many kinship groups. A man may be expected to defer in all things to his maternal uncle, or he is allowed unlimited access to this uncle's property; he is prohibited from addressing his parents-in-law or even from looking at them or using their names; he is on terms of unusual familiarity with specified relatives, so that practical jokes and horseplay of all kinds are permitted; etc. In our culture the prescriptions and privileges are perhaps more obscure, but they evidently exist—as the mother-in-law jokes sufficiently testify.* We are clearly not entitled to behave in just the same way towards all our relatives, even when they belong to the same age group.

The conditions under which families are formed and broken up are also determinative of much conduct. Compare, for example, the following customs of prerevolutionary China with those obtaining among ourselves: ⁶

In China the family generally remains undivided till the children of the younger sons are beginning to grow up. Then the younger branches of the family separate, and form their own households. But the new householders continue to take part in the ancestral worship of the old home; and mourning is worn in theory for four generations of ascendants and descendants in the direct line, and for contemporaries descended in the same fifth generation from the "honoured head" of the family.

Historical background of the western family ⁷

(1) *Roman law and custom.* According to early Roman law, the power of the father was absolute over his children, and permitted him to sell them into slavery or put them to death; and a woman when she married merely passed from

* The feeling towards the mother-in-law among most primitive peoples is, however, one of respect rather than hostility.

the *potestas* of her father into that of her husband. The early Romans, however, were monogamic, and divorce was so rare that the first instance was believed by the Romans to have occurred in 231 B. C. Later, however, it was possible for the wife to remain under the *potestas* of her father, and so she was enabled to hold property in relative independence of her husband, and her consent to marriage was even expected; but coincidentally divorce became rather frequent, either party being able to terminate the arrangement at will without assigning a reason. It is possible that the general level of married life was lowered somewhat in the general dissolution of the austere ideals of the early Republic.

(2) *Germanic law and custom.* The barbarian invaders of the Roman Empire also gave the husband great power. Wives were acquired by purchase or by capture, and their tenure was much less certain than that of Roman matrons. Polygamy was allowed, although it was not extensively practiced except by the chiefs. The Teutonic customs persisted for a long time after the barbarians were Christianized.

(3) *The Christian influence.* The early Christian church was strongly ascetic, and as a consequence celibacy was preferred. Marriage was looked upon as a device to curb the lusts of the flesh in those to whom celibacy was impossible. While not a positive sin, marriage was nevertheless a hindrance to spirituality—or as Paul expressed it:⁸

I would that all men were even as I myself. But every man hath his proper gift of God, one after this manner, and another after that. I say therefore to the unmarried and widows, It is good for them if they abide even as I. But if they cannot contain, let them marry: for it is better to marry than to burn. . . .

Art thou bound unto a wife? seek not to be loosed. Art thou loosed from a wife? seek not a wife. But and if thou marry, thou hast not sinned; and if a virgin marry, she hath not sinned. Nevertheless such shall have trouble in the flesh.

Marriage was a mystic sacrament binding two people together—"the twain shall become one flesh"—and consequently it was absolutely indissoluble, while consent was a

necessary prerequisite. By about the end of the twelfth century so far as England was concerned, a solemn religious ceremony was prescribed to sanctify the union.⁹ The Council of Trent (1546-1563) denied the validity of marriages not celebrated by a priest.

The medieval attitude towards marriage was curiously contradictory. Marriage was a sacrament, and yet it was a perilous thing of the flesh. Women were frequently inveighed against, and yet they were also made the objects of reverence and worship, and all womankind was honored in the person of the Blessed Virgin. By many earnest souls all the heats and passions of love were decried, and men fled from the world in order to remove themselves from its evil temptations; but on the other hand devout mystics went far toward placing sensuous and even sensual love at the very center of their religious life, and in their ecstasies sometimes conceived themselves as being translated bodily into the divine embrace. The troubadours sang the praises of love in its own sweet beauty, while disparaging marriage as a gross contamination of the ideal. Their own lives were not notably exemplary. Dante completed the medieval tradition and made it metaphysical in the *Divine Comedy*, in which he elevated his beloved Beatrice, whom he had seen but a few times in this life before she died while he was yet a young man, into a symbol of God's unchanging love that keeps and sustains all things.

The Protestant reformers held that marriage was not a sacrament, but really a form of civil contract, and that divorce was therefore possible; but on the other hand marriage was regarded as a highly desirable state, and the celibacy of the clergy was therefore abolished. It was not long before the advisability of an ecclesiastical ceremony was asserted, and at the present time most Protestants are married by religious officers, although civil marriage is legal in nearly all countries, and a license is usually required.

The present situation of the family

At the present time the family is torn between two rather contradictory groups of forces. Most of our ideas and moral

notions concerning women, love, marriage, etc., are derived from the more or less distant past, while the objective conditions under which the modern family must function are determined by the Industrial Revolution. The prevailing morality of sex is still a combination of property notions and asceticism. On the one side, a man is still thought to possess an exclusive property interest in his wife which society must protect against trespass; marriage is regarded as a contract in which the parties obligate themselves "till death do us part"; the law still prefers that marriages should be dissolved only for gross physical breaches of this contract (as adultery, cruelty, or failure to support). On the other side, the prevailing morality still conceives of sexual relations as mysteriously evil, nasty, and unspeakable, a thing somehow born of sin and the devil; until even those who do not share these feelings often experience an unhealthy reserve and shame in connection with the topic.

Those who do not share these views as often as not fly to another extreme, and dream silly idyllic romances about love that are often quite as harmful, when the awakening comes, as the dull stupidities to which they are a contemporary alternative. Marriage is entered into as a result of a passion which we admit is near akin to madness; and the most important social institution is founded upon a highly private, highly irrational, and often highly transitory disturbance concerning the real nature of which human beings know almost nothing. Under such conditions it is often easy to mistake an ephemeral gust of passion for that deeply abiding and growing affection that has often meant so much to human lives.

The actual conditions under which the contemporary family must function stand in vivid contrast to the prevailing legalistic, ascetic, and romantic notions inherited from the past. The most important changes are a result of the altered economic status of the institution in a highly industrialized society. In the old days the family was a production unit; it manufactured many of the commodities it consumed, and in addition it was a center for the production of goods for sale to other groups. Today most goods are

produced either in factories or on large farms by hired men. The men do little or no work around the home, while the domestic labor of the women is reduced largely to cleaning, cooking, and taking care of the children—if there are any. Frequently economic necessity requires not only the husband but also the wife and all other able-bodied members of the family to hold outside jobs, so that each member of the group earns an independent wage, although the whole group may be economically less well off than when the family unit was more self-sufficing. Meanwhile a considerable number of women in the better class homes have lost their domestic responsibilities, and have found nothing else to take their place, so that they live practically useless lives and grow restless in the search for something to occupy their time.

Parallel to these changes there have occurred a number of important alterations in the social functioning of the family. Most of the formal processes of education, after babyhood has passed, have fallen into the hands of the community. The family as one of the primary face-to-face groups, of course, still retains its great educational importance, but in many households the children see very little of their father except on holidays, and in more than a few both parents are absent at work during the day. Again, children are brought up in an environment almost devoid of tools and productive operations, so that the boys get little training in the use of their hands and the girls learn almost nothing about cooking or housekeeping. Further, with the great growth of urban life the nature of the other face-to-face groups into which children are thrown (as for instance, neighborhood and school groups) has been much altered. Living an urban life also weakens family ties by providing a great diversity of interests lying outside the home, so that the members of a contemporary household often both work and play apart from each other.

The pressure of our economic life leads to increased celibacy, later marriages, fewer children, more divorces, and a general loosening of family bonds. Statistics of failure to marry are not easy to obtain, but it seems that at least 10

per cent of American women remain single, while the percentage of never married males is still larger. And many of the marriages that are made come as the child-bearing period is drawing to a close or is already over. Thus in 1910, of persons between 25 and 34 years of age, 35 per cent of the males were single and 21 per cent of the females, while of persons between 35 and 44, 17 per cent of the males and 11 per cent of the females were unmarried.¹⁰ The figures are higher for urban than for rural populations, so that in New York City in 1910 42 per cent of the males over 15 and 36 per cent of the females over 15 were unmarried, as compared with averages of 38 per cent and 27 per cent for all rural districts.¹¹ The native born children of foreign or mixed parentage in our large cities have even higher rates of single-ness—56 per cent and 49 per cent for males and females respectively in New York City. In England and Wales in 1920 the mean age at marriage* was 27.51 years for all males not previously married, while for females it was 25.54 years—an average postponement of marriage since 1896 of 0.88 year for men and 0.40 year for women.¹²

It thus happens that fewer families per unit of population are formed, and that the number of children per family has decreased, both because marriage is entered into later, and because young married people of today do not find it economically advisable to have children. In 1790 the average size of the American family was 5.7 persons, while in 1900 it had fallen to 4.6 persons; in 1790, 7.8 per cent of American families had no children, while in 1900, 15 per cent were in this condition.¹³ The number of children under 16 years of age per 1000 of population has decreased as follows:¹⁴ 1790, 49.0; 1820, 48.9; 1850, 43.1; 1880, 39.0; 1900, 35.6. In New England the decline since 1790 was from 47.0 per 1000 to 29.1.

Parallel to these phenomena runs a great increase in the number of divorces. In a survey of Nassau County, Long Island, which was made for another purpose, in a group of several thousand average individuals 1.7 per cent of those who had been married and were aged between 21 and 60

* The age such that as many persons are married above it as below it.

years had been divorced or separated. In 1916 the divorce rate in the United States was 112 per 100,000 population, as compared with a rate of 28 per 100,000 in 1870.¹⁵ In the old days divorce was primarily used by the husband to get rid of an undesired wife (the first case of the divorcing of a husband in England occurred in 1801), but today over two-thirds of our divorces occur at the instigation of the woman.

These changes in the constitution of the family are paralleled by analogous changes in the general composition of the population, especially in its age constitution and the rate of population increase. In a country like France, where the total population is almost stationary, the average citizen is about five years older than the average American citizen, and there are fourteen more persons per thousand between the ages of 40 and 60.¹⁶ With respect to the rate at which the population increases, the figures for the United States are similar to those for other countries which have come under the influence of our industrial civilization. If we take the per cent of increase of each census over the preceding census, beginning with the increase of 1800 over 1790, and ending with that of 1920 over 1910, we get the following figures: 35.1, 36.4, 33.1, 33.5, 32.7, 35.9, 35.6, 26.6, 26.0, 25.5, 20.7, 21.0, 14.9. The drop in the rate of increase of population indicated by these figures took place in spite of great additions to the population through immigration. Similar figures for England and Wales, beginning with the increase of 1811 over 1801, and ending with that of 1921 over 1911, are as follows: 14.0, 18.1, 15.8, 14.3, 12.7, 11.9, 13.2, 14.4, 11.7, 12.2, 10.9, 4.9.*¹⁷

Important as these demographic changes are, with all of their effects, direct and indirect, upon human living, they are far overshadowed by the direct psychological consequences of the new conditions surrounding family life. The life of the average man is greatly altered if he marries a year or two later and has one child or none instead of two or three. It is hard to say just what effect the enforced sexual

* The smallness of this last figure indicates one of the most important consequences of the World War.

abstinences have, especially since our society tacitly recognizes prostitution and since the sexual standards of the unmarried have in recent years become noticeably less rigorous, but it is clear that many sexual difficulties are developed in persons who under more favorable conditions would not have been pushed over the vague border-line that separates normality from definite maladaptation. Even if such matters be left out of account, however, the altered modes of life are of great personal and social significance. The person who lives alone or as a mere adjunct to a home not of his own making is placed a little outside the range of the socializing influences of sex, and his personal habits can easily become so well stabilized and self-centered that no love affair ever succeeds in opening up for him the vital experiences rendered possible by a healthy love life.

It is very easy, on the other hand, when two starved lives are finally joined, for love to give rise to what has been rather cynically described as "double selfishness." It is perhaps natural that lovers at the start should be entirely engrossed in each other, but this introversion of the energies of love is dangerous and devitalizing if it continues for too long. The lovers need to achieve a new and healthy relationship to other people, as well as to each other, as a result of their new status. Indeed, the real interests of their love itself are often at stake here, for it is just such couples who find, when the pleasures of billing and cooing have abated, that they have nothing on earth to keep them together. To the extent that such introversions of love persist, two persons are drawn closely together into a fundamentally unhealthy alliance that also succeeds in removing them from intimate contacts with everyone else.

Functions still open to the family

In spite of the great changes in the nature of the family enumerated above, it still seems to be needed for the fulfillment of a number of highly important social functions. There exists no reason for predicting its speedy disappearance from the culture pattern, although its precise structure will no doubt be considerably altered in the near future.

The following activities stand in need of regulation in every society, and will probably remain among the functions of the family for a long time to come:

(1) *Regulation of sexual intercourse.* In every culture the regulation of inter-sexual intimacies has largely fallen to the family, although other arrangements for the same purpose nearly always exist. While these alternative institutions may gain a wider recognition, so that children may be born and reared without stigma outside of wedlock, and the number of accredited ways of living together thereby be enlarged, it seems likely that the family essentially as we know it today will remain society's chief method of controlling the relations of the sexes.

(2) *The care and rearing of children.* It cannot be too often urged that society's chief interest lies in the children that may result from sex intercourse, rather than in the details of sex relations. It is much more important that healthy children of good heredity shall be born into favorable environments, than that men and women shall conform strictly to any given code in their relations with each other. Everything possible should be done to keep the standard of births high, and to provide every child with the opportunities necessary to its best development. Needless to say, we are far from being in a position to handle either of these great problems at the present time.

If unborn children should ever frame a bill of rights setting down the conditions under which they would consent to come into the world, they might very properly claim the following: the right to be well-born; the right to be protected during immaturity; the right to become acquainted with the ways of the group into which they are born, and the resources it offers for a full life; the right to the development of their special powers; and the right to live their own lives. With respect to each one of these "rights," the family more than any other institution is placed so that it can give or withhold. No satisfactory arrangements for the upbringing of children outside of the family institution have as yet been devised. It seems less hopeless to attempt to introduce enlightened knowledge and methods into the home than to bring up the

children outside of the home environment. With all of its deficiencies, the average family still furnishes a better environment for the child than the average charitable institution. Parental affection, even when unwisely visited on a child, is usually better than the professional carefulness of institutional life.

(3) *A device for the allocation of social rights and responsibilities.* The family is still an important institution by virtue of a considerable number of miscellaneous social functions associated with it. Thus it is through the family bond that property is normally inherited; the members of the family group are bound to each other by ties of privilege and obligation; many rules of etiquette and details of social relationship center around the institution; the family is still the chief agency for the economic consumption of the basic life-necessities, however poorly it may on the average perform this function; etc.

The connections of the family with the other elements of the culture pattern are therefore numerous and intricate, and in spite of its substantial alterations under the pressure of contemporary forces the family continues to perform indispensable social functions. For a long time to come it may be expected to exist with roughly the same outlines that it shows at present, although its structure will no doubt be loosened considerably or be supplemented by the development of other approved social forms fulfilling some of its biological functions.

Psychological problems connected with the family

(1) *Husband and wife.* Men and women differ markedly in general physical appearance, especially at maturity and among highly civilized peoples. In early childhood and in old age, and among the more primitive peoples, the two sexes are more nearly alike, not only because the physiological functioning of the sexes in these groups is more nearly similar, but also, probably, because their ways of life under those conditions are less varied. Sex differences manifestly extend much further than the various organs devoted directly to sexual purposes, for as Thomson has pointed out, "it

seems, in fact, as though the body was 'sexed' through and through." ¹⁸ Practically every organ and part of the body functions in a different manner in men and in women.

So far as the sexual functions themselves are concerned, the differences between men and women, of course, are great. The whole economy of the female body, from the point of view of sex, almost always centers around child-bearing; while in the male the chief focus of sexual interest is often to be found in the sexual act itself. Sex desire, therefore, is usually slightly weaker in the female, while the desire for children is relatively stronger. To some degree, no doubt, social influences are here at work; but the difference also seems to be founded on fundamental physiological facts. In addition, sex desire in the male is usually more intermittent than in the female. These differences often give rise to difficulties in married life, for two somewhat discrepant interests about which neither party may know very much may there demand satisfaction.

Although the sexes undoubtedly differ in our culture in their characteristic interests and in what might be called their spiritual outlook on life, it is hardly possible, in the present state of our knowledge, to state very precisely just what these differences are, since men also differ from men, and women from women, and the range of the differences within each group is very large, and considerably overlaps any differences between the two sexes which may also exist. Sex is apparently not a thing which one either has or has not. It is rather a general name for a large group of associated traits, present in varying strengths and combinations in different peoples, so that many members of one sex will be strongly endowed with qualities usually exhibited by the other sex. This is true no less of the anatomical than of the psychological attributes of sex.

At the risk of appearing to supply knowledge where perhaps it does not as yet exist, the following quotations—one from F. Marion Crawford, the novelist, and the other from Edward Carpenter, the English prophet of a new order—are hazarded as attempts to indicate fundamental mental differences between the sexes: ¹⁹

- (1) There must be some original reason why all boys call girls silly, and all girls think boys stupid. It must be part of the first manifestation of that enormous difference which exists between the point of view of men and women in after life.

Women are, in a sense, the embodiment of practice, while men are the representatives of theory. In practice, in a race for life, the runner who jumps everything in his way is always right, unless he breaks his neck. In theory, he is as likely to break his neck at the first jump as at the second, and the chances of his coming to grief increase quickly, always in theory, as he grows tired. So theory says it is safer never to jump at all but to go round through the gates, or wade ignominiously through the water. Women jump; men go round. The difference is everything. Women believe in what often succeeds in practice, and they take all risks and sometimes come down with a crash. Men theorize about danger, make elaborate calculations to avoid it, and occasionally stick in the mud. When women fall at a stone wall they scream, when men are stuck in a bog they swear. The difference is fundamental.

- (2) It is a commonly received opinion that woman tends more to intuition and man to logic; and certainly the male mind seems better able to deal with abstractions and generalizations, and the female mind with the personal and the detailed and the concrete. And while this difference may be in part attributable to the artificial confinement of women to the domestic sphere, there is probably something more organic in it than that. At any rate it gives to Woman some of her best qualities—a quick and immediate perception, appreciation of character, tact, and a kind of artistic sense in the ordering of her own life, so that you do not see the tags and unravelled ends which appear in man's conduct. While the man is blundering about, fighting with himself, hesitating, doubting, weighing, trying vainly to co-ordinate all the elements of his nature, the woman (often no doubt in a smaller sphere) moves serene and prompt to her ends. Her actions are characterized by grace and finality; she is more at unity with herself; and she has the inestimable advantage of living in a world of persons—which may well seem so

much more important and full of interest than that of things.

On the other hand, this want of power of generalization has made it difficult for woman (at any rate up to today) to emerge from a small circle of interests, and to look at things from the point of view of public advantage and good. While her sympathies for individuals are keen and quick, abstract and general ideas such as those of Justice, Truth, and the like have been difficult of appreciation to her; and her deficiency in logic has made it almost impossible to act upon her through the brain.

Many easily observed differences between the sexes are undoubtedly social. Men and women have been differently regarded, and have been thrust into different ways of life. Thus when investigators by systematic eavesdropping discover that men as a class talk most about money and business, with amusements a not very close second, while women talk most about men, clothes, and household furnishings, they have probably come upon a social difference between the two groups. A comparison of the insanity rates for men and women discloses further socially created differences. At the first glance, the common view that men show greater variability than women (that is, that men are by nature more disposed both to genius and insanity) seems to receive confirmation, since a good many more men than women per unit of population are in institutions. For example, in 1910, 72.1 men and 59.7 women per 100,000 were admitted. When general paralysis and alcoholic psychoses are subtracted, however, the admissions were 54.4 men and 55.6 women per 100,000. These two items, in other words, account for the sex difference, which is thereby in all probability shown to be social; paralysis is often caused by overstrain and undue exertion under modern business conditions, and is therefore largely an occupational disease of men, while alcoholic excess until recently among most classes of the population was almost entirely a male prerogative. Further close study of many so-called sex differences would probably have the effect of demonstrating that they are mainly social in their nature, although the fact remains

that the two sexes are palpably different in their makeup and possibilities.

Until very recently few professions unassociated with sex behavior and family life were open to women, so that the chief female types that have come down to us from the past are the "lady," the household drudge, and the prostitute.²⁰ Man's life was so arranged that, when he fell in love, he might well be expected to redouble his energies in the general social world, while with marriage woman's sphere contracted greatly. Woman's place was in the home; she had no political interests apart from those of her spouse; she contributed to the work of the world by gracing her household, and through the children that she bore; she was too frail and weak a creature to enter into the sweat and turmoil of active public life; her purity would be sullied by contact with the world's hard realities—these were the sentiments of a day that now is gone forever. That these views regarding women were largely dependent on literary conventions goes without saying. The women of past times were not as a matter of fact too weak to share the burdens of living, though their lives covered a far more circumscribed area than that open to women today.

Many of the old difficulties of married life still persist, and the peculiarities of the contemporary institution no doubt add others. A fairly good idea of the psychological problems of the modern family at its best can be secured by a survey of the results of a questionnaire sent out to 1000 married women by the Bureau of Social Hygiene.²¹ The questionnaire went to "married women of respectable standing in the community and of sufficient intelligence and education to understand and answer the questions submitted," all of them persons who had answered a letter expressing willingness to coöperate. The average age was 38.3 years, and 69 per cent were college women. Of those who answered, 872 had had a happy married life, while 116 were unhappy. The reasons assigned for unhappiness, in the order of their importance, were: incompatibility of temperament or interests (40 times); difficulties of adjustment of sex life (23 times); economic reasons (14 times); unfaithfulness of hus-

band (12 times); alcoholism of husband (10 times); no children (4 times—though 20 per cent of the whole group answering the questionnaire were childless); wife's love insufficient (4 times); disparity of age (3 times); other reasons (24 times). The average age of the happy was 37.5 years, of the unhappy 42.9 years. For comparative purposes 116 happy wives of the same age and education as the 116 unhappy were selected, with the following results:

In the matter of good health before marriage, general sex instruction before marriage, stability of health after marriage, and the presence of children in the home, the percentages are a good deal higher among the happy 116. . . . On the other hand, . . . spooning, sex intercourse before marriage, and occupation outside the home after marriage apparently militate against the happiness of marriage.

(2) *Parent and child.* Nearly all adults oscillate between two mistaken attitudes in their dealings with children. They either assume that children are grownups in little, that they have adult interests and capacities on a small scale, and therefore are to be treated as if they were mature mid-gets; or, giving children credit for a fairly distinct way of life, adults condescend to them, changing their voice and manner entirely when they address a child. The latter device is also often used with foreigners, one's social inferiors, etc., where it is just as much out of place as it is with children. Treating a child with condescension can easily lead to uneasiness, the development of unnecessary inhibitions, and perhaps the raising of unhealthy barriers against the outside contacts so crucial to growth. The plan of treating children as adults in miniature, however, is hardly better, though it undoubtedly would have fitted the *enfant terrible* of Locker-Lampson's poem:

I recollect a nurse called Ann,
 Who carried me about the grass,
 And one fine day a fine young man
 Came up, and kissed the pretty lass:
 She did not make the least objection!
 Thinks I, "Aha!

When I can talk, I'll tell Mamma."

—And that's my earliest recollection.

The first essential to an understanding of the child is a clear recognition of the fact that he lives in a different world from his parents. His interests and horizons are such that he does not see the same things as they do, though more imperfectly; he sees, and is concerned about, quite different things. Nor are the excellences all on the one side or the other. It is, however, one of life's tragic necessities that the child as he grows up must leave his world behind him, for the most part, if he is to live a healthy adult life, and it is one of the chief functions of parents to see that this transition is accomplished as painlessly and effectively as possible. As much of the joyous freedom, spontaneity, and *élan* of a healthy childhood should be conserved as possible, and, so far as may be, its infantilities should be sloughed off; while, on the other hand, no person has done as well by his child as he might if he guarantees him, in return for the loss of his childish horizons, no larger world than that of the here and now. The mere present is always too narrow a realm in which to live. The world of the child is sometimes spoken of as though it were small and circumscribed, but (except as adults in their ignorance stunt and repress it) it is always full of possibilities, and it is a shame if, as the questions and wonderings of childhood are slowly settled or disappear, new worlds to conquer or to wander in are not guaranteed.

REFERENCES

¹ These matters are thoroughly covered by R. H. Lowie, *Primitive Society* (N. Y., Boni and Liveright, 1920), Chaps. 2-8.

² Lowie, 42-43.

³ Lowie, 22-23.

⁴ Edward Westermarck, *The Origin and Development of the Moral Ideas* (London, Macmillan, 1908), Vol. 2, 400-402.

⁵ Westermarck, Vol. 2, 422-424 f.

⁶ Westermarck, Vol. 2, 213.

⁷ The data are conveniently summarized in L. T. Hobhouse, *Morals in Evolution, A study in comparative ethics* (2 ed., N. Y., Holt, 1907), 206-230.

⁸ First Corinthians, Chap. 7.

⁹ W. G. Sumner, *Folkways, A study of the sociological importance of usages, manners, customs, mores and morals* (Boston, Ginn, 1907), 411-413.

¹⁰ *Thirteenth Census of the United States: Abstract of the Census* (Wash., Govt. Printing Office, 1913), 147.

¹¹ *Thirteenth Census, Abstract*, 163, 164.

¹² Arthur Newsholme, *The Elements of Vital Statistics in their bearing on social and public health problems* (3 ed., London, Allen and Unwin, 1923), 66.

¹³ *A Century of Population Growth, from the first census of the United States to the twelfth, 1790-1900* (Wash., Govt. Printing Office, 1909), 96, 98.

¹⁴ *Century of Population Growth*, 103.

¹⁵ R. E. Turner, *American in Civilization, Designed as a text-book for college and university use in courses introducing students to life* (N. Y., Knopf, 1925), 119.

¹⁶ Newsholme, 59-60.

¹⁷ Newsholme, 96, 98.

¹⁸ J. A. Thomson, in *Scientia*, Vol. 15 (1914), 392; see Havelock Ellis, *Man and Woman* (5 ed., N. Y., Scribner's, 1914), for the relevant data.

¹⁹ F. Marion Crawford, *The Heart of Rome*, Chap. 5; quoted from J. Welton, *The Psychology of Education* (London, Macmillan, 1911), 129-130. Edward Carpenter, *Love's Coming of Age* (7 ed., London, Methuen, c 1924), 50-52.

²⁰ Carpenter, 43.

²¹ Summarized in *Mental Hygiene*, Vol. 7 (1923), 831-833. The complete data are in K. B. Davis, A study of the sex life of the normal married woman. II. The happiness of married life. *Journ. of Social Hygiene*, Vol. 9 (1923), 1-26, 129-146.

Chapter XVI

ART AND THE ENJOYMENT OF LIFE

The theme of this chapter

In this chapter art will be analyzed as one of the chief contributors to man's happiness and well-being. While the discussion will have to be fairly general, so that the intrinsic and more universal connections of art with human life may not be obscured, no attempt will be made to evade current issues and problems. Of these no doubt the most important is the relation between useful and so-called fine art. Here our effort will be to point out (without abating any of the merited praises that men have uttered in favor of the fine arts) that as noble arts they do not stand unique in the culture pattern, but that they have sisters, perhaps less well recognized as "fine," but equally worthy of recognition. The distinction of genuinely fine as opposed to spurious art depends to a considerable degree upon the intimate connection of art with human welfare—a connection that can hardly be understood so long as sculpture, painting, architecture, music, and poetry (great as they are) are honored above their blood sisters.

Few subjects, indeed, are vexed with more and greater confusion than that of the nature of art. Into the jungle of darkness created by the various formal philosophies of art we shall not venture to penetrate, although the beams of light that here and there pierce the tangled forest might well disclose much to intrigue a curious mind. Philosophers at different times have credited art with almost every human merit, due no doubt, to the fact that they have usually been content to append their esthetic views (somewhat inartistically) to already completed systems.* In this chapter we shall try to arrive at sound ideas concerning the nature of

* Schopenhauer, Dewey, and perhaps Croce among recent philosophers furnish exceptions. It is surprising, for all their boldness and general irresponsibility, how narrowly philosophers have conceived the metaphysical enterprise. They have been very easily set agoing.

art from a study of the creative life of the artist and from an inquiry into the cultural functions of completed works of art. In the main our data will be taken from painting, largely because the materials required for our analysis are most easily available in this field; but there seems no reason to think that analogous studies of the other arts would lead to conclusions different from those we shall offer. Upon the basis offered by these analyses of the artist's life and of the function of pictures in the culture pattern, we shall try to frame a satisfactory definition of art.

The creative life of the artist

In this section the following topics will be discussed in the order named: (1) ways of experiencing the world; (2) how the artist treats his experiences; (3) technique in the creative life; (4) imagination in the creative life; (5) why the artist creates.

(1) *Ways of experiencing the world.* It is surprising to what a slight degree our daily life depends upon clear and accurate acquaintance with the things among which we move. Ours is a roving and unsettled glance, given to looking everywhere and seeing little, quick to catch a movement, apt at sensing change, wondrously facile in guiding us through the maze of objects that obstruct our path, but unbelievably incompetent when it comes to telling us just what things are like. When we read our eyes do not move steadily and comprehensively across the page; they advance by little leaps, like the hops of a bird—four or five to the width of a newspaper column. Nothing much is seen while they are in motion. The fixations are not nicely joined together; in most instances they overlap or there are gaps between, but we read on just the same. Careful experimentation has shown that we do not actually see more than a small proportion of the words we read.¹

Throughout much of life it is our settled habit to deal almost entirely with the labels of things. A glance, and we know that the person coming towards us is a stranger; another glance, and we recognize a friend; but what friend or stranger really looks like we should be at a loss to say.

It is for this reason, no doubt, that so much of testimony in courts of law is of little value; and it is because the scientist knows that he cannot trust his senses for exact work that he so often has recourse to instruments. We treat the world as cavalierly as we treat the coins we carry in our pockets—it is enough that this is a nickel and that a *Saturday Evening Post*; the one exchanges for the other unquestioned upon the slenderest possible identification. We trade a label for a label, and know neither what we have nor what we give. In this manner we skate thinly over the surface of things, being almost entirely untouched by them as they forever flow in and out of our lives. Most of our stock notions of actions—even those which occur over and over again—are highly schematized, if not entirely conventional. Take running, for example; it is easy to run one's self, or to identify the activity of running, but when slow motion pictures are taken of the act, most of us are surprised to see for the first time what really happens when a man runs. Our notions of running are only casually connected with the actual activity.

Some of the graphic conventions of a culture can be observed even in children's drawings; for example, in the way they represent the human figure. It is a commonplace that children do not draw from a model, but rather from their notion of what the model should be like. We shall have occasion shortly to show how the culture pattern affects the developed activity of mature artists.

Although much of life is transacted, not with things as they are, but as men think they are, no man's career consists entirely of this strange commerce of ghosts. Not every experience slips through his fingers, leaving only a label behind; nor does he always give and receive in anonymous coin. Sometimes when friend meets friend, they both see and are seen; or again, a tree standing silent and alone against the sky wins an undivided gaze; or once more, a touch upon the arm becomes for a moment the sum and focus of a unified experience; or the sober play of color against color, of form against form, on the trunk of a sycamore fills the eye with the joy of seeing.

Now the artist, as experiencer, is a person whose life is more given over to such realizations than the ordinary man. It may be that his span of attention or his depth of penetration is greater, or that his interests are stronger or more focussed; but for whatever reason, his world is more densely populated with directly moving stimuli. It was a poet who wrote the following: ²

There are no abstract passages in nature. There are no catalogues of common names. Nature does not exist in classes—blacksmiths, carpenters, oil-works, white-lead works—but exists in the smoke and sweat of individual specimens. Nature does not signify by names but by qualities.

Whether this be the total truth we need not say—certainly some poets (as for instance John Donne) have dealt with highly abstract subjects—but without doubt it is the office of the artist to experience nature so vividly that such statements might well be true. Thus by a daring metaphor Carl Sandburg makes a certain fog live again:

The fog comes
on little cat feet.

It sits looking
over harbor and city
on silent haunches
and then moves on.

(2) *How the artist treats his experiences.* Regarded somewhat schematically, it is the task of the artist to focus and harmonize three different sets of phenomena:

- (a) *Natural objects.* Thus if he paints landscapes there will at different times pass before his eyes trees, meadows, hillsides, country roads, etc., varying in attractiveness and potentiality for his purpose.
- (b) *Conventional understandings.* Both the artist and his public will entertain certain notions of what constitutes a landscape, what a tree should look like, how a picture should be painted, etc. The notions accepted

by the artist will probably not coincide perfectly with those of the interested public.

- (c) *Esthetic qualities* (conventional or otherwise). Certain shapes, color relations, patterns, rhythms, etc., are emotionally stimulating, either when taken abstractly or when considered as vehicles for the representation of specific natural objects.

(a) *Natural objects*. The artist's task is essentially one of translation. A certain group of natural objects existing in one highly organized set of relations (that of the order of nature) must be rearranged and reorganized in terms of another intricate set of relations (that of our esthetic and conventional requirements). It is out of the question for art to imitate nature, both because such an imitation is impossible and because it does violence to the psychological principles of esthetics:³

It is really not possible to give a three-dimensional representation on a flat surface or to fix a movement in a picture except in accordance with a definite mental concept which can conform only in a very slight degree with the visual impression. Even the simplest pictorial expression rests on an abstraction deduced from nature, and the more complicated and purposeful the creation, the more it is dependent on the artist's power to make a plausible presentation of his abstraction that shall correspond with our experience and preconception.

The general problem of the artist differs little from that of representing a three-dimensional world on a flat two-dimensional piece of paper. The problem is solvable only with some distortion of the areas mapped, and hence map-makers have devised conventional projections designed to distribute the inevitable errors and increase the utility and intelligibility of their representations. In precisely the same way are conventional esthetic rules and understandings employed by artists in the manufacture of works of art—although the rules of painting are not so strict as those governing map-making. Also, they are more subtle and elusive, and are scarcely understood, even by those who employ them.

Although works of art cannot hope to imitate nature, it must not be thought that the artist can entirely sever his connections with the natural world. An art which is not to be sterile and finicky must always have a basis in the natural world—as even those who wish art to be highly abstract are forced to recognize. Thus we find Clive Bell writing as follows: ⁴

It would be almost impossible for an artist who set himself a task no more definite than that of creating, without conditions or limitations material or intellectual, significant form [this writer's name for creations embodying artistic values], ever so to concentrate his energies as to achieve his object. His objective would lack precision, and therefore his efforts would lack intention. He would almost certainly be vague and listless at his work. It would seem always possible to pull the thing round by a happy fluke, it would rarely be absolutely clear that things were going wrong. The effort would be feeble and the result would be feeble. That is the danger of aestheticism for the artist. The man who feels that he has got nothing to do but to make something beautiful hardly knows where to begin or where to end, or why he should set about one thing more than another. The artist has got to feel the necessity of making his work of art "right." It will be "right" when it expresses his emotion for reality or is capable of provoking aesthetic emotion in others, whichever way you care to look at it. But most artists have got to canalise their emotion and concentrate their energies on some more definite and more manageable problem than that of making something that shall be aesthetically "right." They need a problem that will become the focus of their vast emotions and vague energies, and when that problem is solved their work will be "right."

This is the very truth: it is only another way of saying that nature is the great mother of the arts. Art not only starts from certain givens, but is at every point dependent on data drawn from outside the artistic impulse. This impulse is itself a natural phenomenon which in its weaker ranges is no extraordinary feature in human life. Art is natural rather than artificial, and the artist is in no peculiar

sense "free" of his world. He works upon the materials at hand in terms of the powers at his disposal, much as do other men, and his most irresponsible visions do not escape the bounds of the world he lives in. Though he owes no formal obligations to nature—for he is an artist and not an echo, a son and not a servant—his dependence is none the less obvious and complete.

(b) *Conventional understandings.* The subjects open to the artist and the manner in which they are to be handled are both controlled by unwritten laws, the former determined mainly by social ideals, the latter largely by technical standards; it being remembered, of course, that matter and method are never completely independent variables. Artists do not paint just anything—they choose their subjects, or they paint subjects selected for them by their patrons, and these choices are usually influenced by non-esthetic considerations. Nor do artists paint in just any manner—they paint in styles which depend upon traditional and historical no less than upon esthetic factors.

Thus Strzygowski points out,⁵ respecting early representations of Christ, that there were two chief spheres of tradition, the Roman-Hellenistic and the Aramaic-Persian, in each of which Christ was represented in accordance with the social ideal. Among the Greeks he was shown as a beautiful youth, either with long locks (Asia Minor) or with short curling hair (Syria, Egypt), while among the Aramaeans he was represented with a beard and smooth parted hair. The latter type won out, and still prevails. Here we see art helping to spread a culture ideal far beyond its initial confines. Another interesting instance is afforded by a comparison of the manner in which medieval and renaissance artists were wont to treat David:⁶

On the cathedrals of the Middle Ages he is often represented as a Christian saint, an old king in long cloak, playing upon his harp. If it be a perfect Gothic statue swathed and enveloped in flowing lines, then the whole composition breathes an atmosphere re-echoing with Psalmodic sentiment, yearning towards a heavenly goal beyond the skies. In Italian art of the Renaissance the old king David is replaced by the

youth, the shepherd boy as the triumphant liberator, with the head of Goliath at his feet. He serves as an excuse for a display of that strength and suppleness that are involved in the problem of representation of youth: he is unclothed and shown in heroic nakedness like the Greek figures of athletes.

The human form played an important part in Greek art not merely because of the peculiarities of Greek esthetic theory, but also because of very general features of the Greek culture pattern. As Cornford has brilliantly shown, the whole of Hellenic thinking was cast in a boldly anthropomorphic mold.⁷ What other people would have thought to describe their gods in the unequivocally human yet at the same time gloriously idealized manner indicated by the following excerpt from the *Iliad*, the Bible of ancient Greece?⁸

To her made answer Zeus the cloud-gatherer: "Lady, good lack, ever art thou imagining, nor can I escape thee; yet shalt thou in no wise have power to fulfil. . . . Abide thou in silence and hearken to my bidding, lest all the gods that are in Olympus keep not off from thee my visitation, when I put forth my hands unapproachable against thee."

He said, and Hera the ox-eyed queen was afraid, and sat in silence, curbing her heart; but throughout Zeus' palace the gods of heaven were troubled. Then Hephaistos the famed craftsman began to make harangue among them, to do kindness to his dear mother, white-armed Hera: . . . "Be of good courage, mother mine, and endure, though thou art vexed, lest I behold thee, that art so dear, chastised before mine eyes, and then shall I not be able for all my sorrow to save thee." . . .

He spake, and the white-armed goddess Hera smiled, and smiling took the cup at her son's hand. Then he poured wine to all the other gods from right to left, ladling the sweet nectar from the bowl. And laughter unquenchable arose amid the blessed gods to see Hephaistos bustling through the palace.

So feasted they all day till the setting of the sun; nor was their soul aught stinted of the fair banquet, nor of the beautiful lyre that Apollo held, and the Muses singing alternately with sweet voice. Now when the bright light of the sun was set, these went each to his own house to sleep, where each one had his palace made with cunning device by famed Hephaistos

the lame god; and Zeus the Olympian, the lord of lightning, departed to his couch where he was wont of old to take his rest, whenever sweet sleep visited him. There went he up and slept, and beside him was Hera of the golden throne.

"The lord of lightning departed to his couch"—these words might be allowed to stand as symbols of an attitude the corollaries of which are exhibited throughout Greek life—in philosophy, ethics, politics, religion, no less than in art.* Further, as della Seta has pointed out,⁹ sculpture rather than painting was the primary Greek art. The precise opposite is the case with Christianity. "The name of Zeus or of Athene did not necessarily recall that of Dionysus or Ares, while in Christian art the name of a Prophet or an Evangelist brought to the mind all the other figures of the whole series in which the one was only a unit." Greek art is largely concerned with single figures, whereas Christian art has to do mainly with groups. Thus Greek artists were led to emphasize plastic (sculptural) values, whereas Christian art for a long time was given over to pictorial values and to didacticism or preaching.

If Greek art fed itself largely on the human form, oriental art was almost entirely restricted to ornamentation and decoration. To make representations of living things was contrary to religious injunctions among many of the oriental peoples (including the Hebrews):¹⁰

Thou shalt not make unto thee any graven image, or any likeness of anything that is in heaven above, or that is in the earth beneath, or that is in the water under the earth.

A similar proscription holds for Mohammedans, and hence we find that the mosaics of St. Sophia at Constantinople, captured by the Turks from the Christians in 1453, are kept covered with whitewash. The *arabesques* of Moorish art illustrate one form of ornamentation developed among peoples who prohibit "graven images."

The researches of Strzygowski and others have done much

* With at least this exception, however, that oriental asceticism entered into and very strongly affected Greek thought. It is clearly apparent, for example, in Plato.

to show how modern art was born through the meeting of the Greek and oriental traditions. "While the Mediterranean influence carried the Hellenistic representation of the human figure eastward as far as India and China, the Oriental brought the motives of Persian decoration westward, and from this interchange the new unity of Christian Medieval art directly sprang."¹¹ There was in addition the specifically Christian contribution, to be found in the concrete subject-matter of medieval art and in its unblushing didacticism. "The first aim of their art is not to please but to teach; they offer an encyclopaedia for the use of those who cannot read, translated by sculptor or glass-painter into a clear and precise language, under the lofty direction of the Church, which left nothing to caprice."¹²

The history of modern painting revolves largely around the play of plastic or sculptural, decorative or ornamental and didactic or representative motivations upon each other. If space permitted, it would be possible to show how, as one approaches modern times, plastic considerations have become more and more important, until today many critics deny the name of art to highly representative works, and look with suspicion on all merely decorative compositions. At the same time it is commonly recognized that painting must remain painting, and not mimic sculpture. For this reason Leonardo's more sculpturesque paintings are condemned by many. The triumph of plastic qualities was greatly accelerated; (i) by the development of painting in oils, which was begun by the Van Eyck brothers in the Netherlands during the early 15th century, because the new medium gave artists much greater control over their productions than did the earlier techniques of painting in fresco or tempera; and (ii) by the emergence of landscape painting as a separate *genre*, after natural scenery had been used for centuries merely as a background for figure subjects. The painting of landscapes from nature offered opportunity for the study of light and perspective, and led naturally to the attempt to treat space plastically—*i.e.*, as a fully three-dimensional entity. The modern point of view is excellently represented in the two quotations that follow:¹³

- (1) The aim of the artist is to create real harmony in the relation of form, not only upon a two dimensional plane balancing from side to side and up and down, but also a balance of receding and approaching planes, and again on a three dimensional plane where solids approach and recede, intersect and travel on parallel planes.
- (2) Form in its artistic sense has four interpretations. First, it exhibits itself as shallow imitation of the surface aspects of nature. . . . Secondly, it contains qualities of solidity and competent construction. . . . Thirdly, it is a consummate portrayal of objects into which arbitrary arrangement has been introduced for the accentuation of volume. . . . Last, form reveals itself, not as an objective thing, but as an abstract phenomenon capable of giving the sensation of palpability. All great art falls under this final interpretation. But form, to express itself aesthetically, must be composed; and here we touch the controlling basis of all art:—organisation. Organisation is the use put to form for the production of rhythm. The first step in this process is the construction of line, line being the direction taken by one or more forms. In purely decorative rhythm the lines flow harmoniously from side to side and from top to bottom on a given surface. In the greatest art the lines are bent forward and backward as well as laterally so that, by their orientation in depth, an impression of profundity is added to that of height and breadth. Thus the simple image of decoration is destroyed, and a microcosmos is created in its place. Rhythm then becomes the inevitable adjustment of approaching and receding lines, so that they will reproduce the placements and displacements to be found in the human body when in motion.

These notions, important as they are, clearly depend upon certain conventions, cultural and technical, that are meaningless apart from the history of western art and of our civilization. As the last quotation suggests, they arise largely from our preoccupation with the human body—or, more precisely, from that preoccupation combined with a number of other factors, some of which we have named. Art is like all other human activity in this at least, that it cannot hope to escape from the bounds of the culture pat-

tern. But it must not be thought that art lies inert and ineffectual in the midst of life. On the contrary, the re-combinations and rearrangements of natural data which it offers have deeply affected human living. What we see in paintings and in other works of art is very often taken as indicative of what things must be in reality.

The silent, collective and largely anonymous pressure of the "objective world of Art" is probably the most potent agency in the art-education of the individual. It represents in its cumulative force, created by the forgotten but combined verdict of past generations—to whom it also owes its preservation—a tremendous standardising power upon the schooling of appreciation and produces adaptations, expectancies, apperceptions and emotional reactions which in their varying degree of rigidity and durability result in more or less fixed habits of taste.¹⁴

(c) *Esthetic qualities*, it will be remembered, together with natural objects and conventional understandings, constitute the three bodies of data which the artist must fuse in his graphic constructions. In the discussion of the two preceding topics, esthetic questions have perforce been mentioned, since they permeate and affect the whole artistic enterprise, but a more detailed survey of the situation from the esthetic point of view is desirable. Before initiating the analysis, however, it may be well to summarize very briefly the chief aspects of the painter's creative life, as follows: Certain objects, with a life and functions of their own in the order of nature, attract the artist's attention as being satisfactory subjects for a painting—that is, for translation into a new order of relations within the frame of his canvas. In order to adapt these natural objects for the fulfillment of the new functions they are to perform in his picture, and at the same time keep them living and real, changes in their construction and relationships are found to be necessary. Some of these changes are based upon conventions, social or technical, such as have already been noticed; others rest upon the more strictly esthetic considerations to which we now turn our attention.

The chief elements of esthetic satisfaction in painting are associated with color, line, and form. We are so built that certain arrangements of these elements are provocative of pleasure, while others awaken distaste or aversion. Indeed, even separate patches of color, isolated lines, and simple forms are capable of exciting esthetic responses of high intensity. The painter speaks to us in part through this simple language of color, line, and shape. Why should red be associated with passion and with danger? Is it because this is the color of both blood and fire? The color red has been compared to the blast of a trumpet; it has a "piercing" quality. Does blue get its quiet yet powerful reserve from the star-bestudded vault of the heavens, and green its buoyant vigor from the leaves and grasses? Why should certain lines be poignant with life, and others dull and void of expression? Why should we feel an impulse to handle a common stone on the beach? Is it that we hope to absorb its simple shape through our fingers?

The eye is visually stimulated by a comparatively narrow range of vibrations in the (hypothetical) ether. The visible "waves" are exceedingly minute—they measure but 390 to 760 millionths of a millimeter in length. When a mixture of vibrations of different lengths hits the eye, we see a shade of gray (ranging from white to black, depending on the intensity of the vibrations); when the vibrations are all of one length (or predominantly so), we see colors. Thus when white light is passed through a prism, its light components are spread out to form a spectrum or series of pure colors, as follows (listing from the shortest waves to the longest): violet, blue, green, yellow, orange, red. Purple, which is itself a mixture and does not occur in the spectrum, stands between red and violet and completes the circle of the "colors," to which we may give the name of *hues*. But hues by a combination of vibrations can also be made to approach pure white or to pure black, so that a whole series of *shades* is created; or a *tint* can be made by mixing a hue (or a shade) with a gray of like intensity.¹⁵ The psychological organization of our color experiences can

be represented by a diagram (Fig. 7). White and black stand at opposite ends of a rather long spindle, with the series of gray shades joining them. This spindle bulges out somewhat at the center to form the hues exhibited in the spectrum (plus the nonspectral hue purple), and tapers down as one moves towards white or towards black. If one passes *around* the spindle at any given level, one runs through a hue series (as from red through orange and yellow to green—see Diagram B of Fig. 7, which represents a slice through the color spindle at the level of greatest thickness, *i.e.*, where it represents the hues of the spectrum); if one passes *up* the spindle towards white, or *down* the spindle towards black, one passes through a shade series (as from pure red to light or dark red); if one penetrates *into* the spindle at any given level, one passes through a tint series (as from pure bright yellow to dull yellow gray). It is estimated that there are about 30,000 distinguishable visual qualities.

These hues, shades, and tints alone or in combination furnish almost innumerable opportunities for esthetic satisfaction. It is the function of the artist to pick out arrangements which adequately embody his purpose. The task is rendered more complicated by virtue of the fact that colors take on different esthetic significances in different surroundings. When colors are juxtaposed they act on each other and create new esthetic values; and a color yields different feeling qualities according to the precise size and shape of the form on which it is laid. Colors, like fluids, mix when they are brought together. Thus certain colors known as complementaries (as red and blue-green, yellow and ultramarine blue, black and white) have the effect of heightening each other when they are juxtaposed.* The modern movement in painting which is known as "Impressionism" owes much to this fact. Thanks largely to the influence of Constable and Turner, who early in the 19th century opposed the traditional "brown tree" of landscape painting

* If one fixates a color for a few moments, and then turns the eyes quickly to a neutral gray surface, the resulting "after-image" will be of the complementary color.

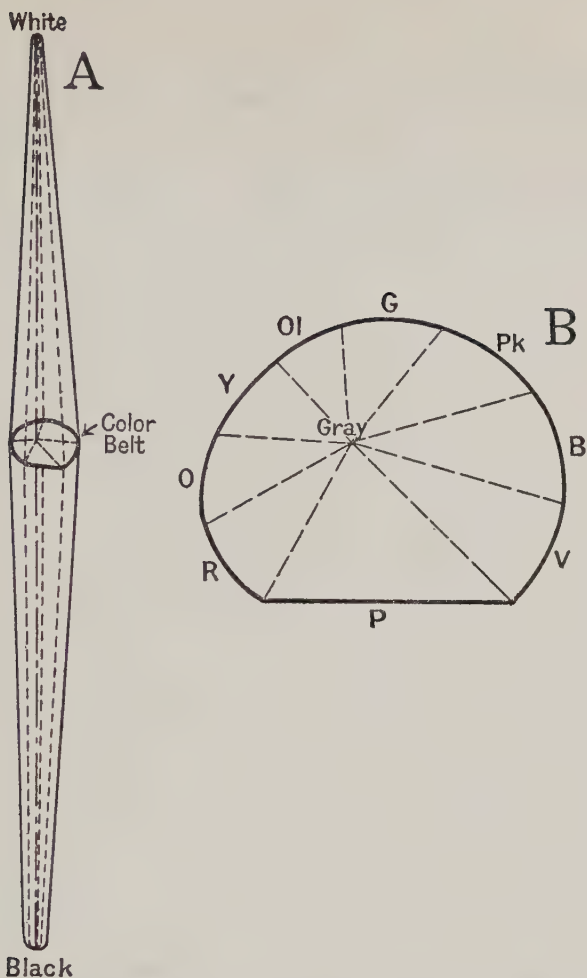


FIG. 7. Color spindle and color belt. A. Color spindle; schematic distribution of distinguishable visual sensations, shades being arranged vertically, tints horizontally, and hues at an angle. The central vertical axis running from white to black represents the series of gray shades. The purest (most saturated) hues lie on the circumference of the color belt. The relative proportion of shades, tints, and hues is roughly indicated by the dimensions of the diagram. B. Color belt enlarged; drawn so as to show the relative number of distinguishable hues for each spectral color and for purple, and so as to indicate the relative saturation of the various pure hues by their comparative distances from the central (gray) axis. Note the tilt of the color belt in Diagram A—i.e., spectral yellow and green are much brighter hues (nearer white) than spectral red and violet. (From Warren, *Human Psychology*, Boston, Houghton Mifflin, 1919, p. 171.)

in favor of the full rendition of nature's light effects, a number of nineteenth century French artists set themselves the task of developing new techniques for the painting of light. Objects and landscapes were painted as reflectors of light and color, and only secondarily as arrangements of lines and forms. The following anecdote is interesting in this connection: ¹⁶

Eugene Delacroix, occupied one day in painting yellow drapery, tried in vain to give it the desired brilliancy, and said to himself, "How did Rubens and Veronese find such brilliant and beautiful yellows?" He resolved to go to the Louvre, and ordered a carriage. It was in 1830. At that time in Paris there were many cabs painted canary-colour. One of these was brought to him. About to step into it, he stopped short, observing to his surprise, that the yellow of the carriage produced violet in the shadows. He dismissed the coachman, entered his studio full of emotion, and applied at once the law he had just discovered, which is, that the shadow cast by an object of a certain hue is always slightly tinged with the *complement* of that hue,—a phenomenon that becomes apparent when the light of the sun is not strong, and our eyes, according to Goethe, who, as Eckermann tells us in his "Conversations," made a similar discovery, "rest upon a fitting background to bring out the complementary."

Only a few of the simplest laws of artistic color combination can be stated in intellectual terms at the present time. In spite of this fact, it is undoubtedly one of the pleasures of the connoisseur to experience, in great works of art, the subtle music of color sounding forth its rhythms and its harmonies.

The esthetic possibilities of mere line are revealed by the severe beauty of outline of a Greek vase, or, again, by the free sweep of a bird in flight or by the lithe curves of a squirrel's tail as he scampers along a stone fence. The eye loves to pass along the crest of distant hills, and many a student, no doubt, has lingered a moment for pure pleasure over a simple but satisfying curve in a mathematics text. Or again, the angular play of branch against branch and twig against

twig in a winter tree often contributes a special note of beauty to the scene.

While we of the west are by no means indifferent to the esthetics of line, it is in Chinese and Japanese works of art that the possibilities of this type of stimulation have been carried to the highest pitch. The artist who uses India ink works in an irrevocable medium. Each stroke stands as made, beyond the reach of retouching or correction. Painting thus becomes a form of writing and, conversely, writing becomes a fine art: ¹⁷

These two modes of expressing emotions and ideas constituted to the Chinese simply two branches of the same tree: writing as well as painting was to them originally a symbolic and pictorial mode of expression, and the value and beauty of the symbol depended in both cases on the handling of the ink and the brush. The ideograph was not simply a means of intellectual communication, its full import cannot be conveyed by transcribing it into Western words, it has a meaning and significance beyond that of ordinary letters. To quote from an article by Professor Taki (in the "*Kokka*," 1916):

"A character may have been written exactly in the same form and style, yet the manner of using the brush makes a world of difference in the result, which may become insipidly lifeless or instinct with power or feeling. However subjective calligraphy may be, it in many instances exhibits features that find coincidences in natural forces. . . . Some critics declare that strokes should convey such impressions as we would receive from towering mountains, rushing currents, rampant dragons, raging tigers, wind-tossed trees, rising clouds, dropping dew, etc. In truth, the more of such symbolic expression a writing bears, the richer it becomes in beauty and grace. A chaotic medley of fantastic flourishes does not, however, conduce to ideal beauty: at the bottom there must be the individual mind to unify all the symbolic signs written."

Pure linear compositions can be seen in borders, scrolls, and frets, as well as in carpets, tapestries and stuffs, pottery, china, ironware, furniture, etc.; but in painting an effective distribution of linear relations is also a desideratum.

Every painting forms a more or less complex pattern filling a certain space, and the artist endeavors to make this pattern satisfying to the eye. In countless Madonnas and in many other paintings of the early Renaissance, symmetry was strongly emphasized, sometimes to the point of exactly balancing the picture about a central point. This balanced type of linear composition is but little employed today, and has given way to more complex arrangements. In the works of men like Gauguin, Degas, and Matisse, however, exquisite regard is paid to decorative composition, Matisse in particular having learned much from an acquaintance with Persian tapestry motifs. The rhythmic, mounting flow of line against line still adds its beauty to that of color and form in great works of art.

Form, the third esthetic element, indicates that quality by virtue of which things occupy space. Color may easily be imagined as having no depth, and line can just as easily be thought of as the dimensionless edge or boundary of two-dimensional color areas; but form necessarily invades the third dimension. We experience form by sight or by touch, by visual or by kinesthetic stimuli, in other words by clues appealing to the eye or to the hand. The artist must organize and unify his picture with respect to these two somewhat distinct types of experience.¹⁸ Of course, it is neither possible nor desirable in a painting to present the *fact* of volume directly; only visual equivalents for form can there be offered, so that even tactual values must be represented in visual terms. Among the devices used to place objects in space are: *superposition*, whereby objects near at hand are made to cover parts of objects farther away; *linear perspective*, whereby parallel lines are made to converge as they approach the horizon, and objects are made to appear smaller as they stand more distant from the eye; *aërial perspective*, whereby distant objects are made less distinct, less sharply outlined, and duller in color; *modeling and shading*, whereby line and color, high-light and shadow, are used to develop spatial relations; *distortion of shapes*, whereby a vivid voluminousness is sometimes achieved through the pull of form against form. The conditions for

a satisfactory visual experience of form do not necessarily coincide with those requisite for tactual pleasure, and hence the artist must search for some happy combination of the values offered by the natural object and by the visual and kinesthetic possibilities.

The artist enriches our intercourse with Nature so far as his individual talent enables him to bring the actual form into situations which lend it new but normal accents of effectiveness. The more normal and typical these accents are in a work of art, the more real is the importance of the work.¹⁹

Esthetic qualities are no doubt closely related to natural forms, from which in the first instance they were probably derived, but in any given artistic problem they need be by no means identical with them. We have the art of painting because men are capable of being directly moved in one way or another by certain dispositions of color, line, and form, which are seldom found pure—unmixed with non-esthetic forms—in the order of nature. In painting we have an endeavor to disentangle them from their natural (partly unesthetic) settings in order to enhance their value.

To the modern artist, nature is material with which to work, not an effect to be transferred to canvas. The modern artist is not even interested in calling up in another person the emotion he felt before the beauty in nature. Some emotional or intellectual reaction in the artist is necessary to arouse the creative impulse. But in the creation of a work of art the artist is interested only in the problems of expression. He is creating something which must live within the space of his canvas, find complete being there through a building up of plastic form and color, the interlacing of planes and textures, of depths and surfaces (something that retains a vivid life of its own through the constant study and seeking of the artist). This is equally true of the finest work of the past and the best abstractions of the present.²⁰

This fact is so important that the following remarks of a great literary artist must be quoted, at the chance of repetition, to show that writers as well as painters share the view we have been stating: ²¹

Life leaves everything as it finds it, precipitates action, or drags it out indefinitely. Art, on the contrary, consists in using forethought and care in elaboration, bringing into prominence, through sheer skill in composition, the essential incidents, and in giving to all the rest the degree of prominence proportioned to their importance, in order to produce a convincing impression of the special truth it seeks to portray.

To make things real consists, therefore, in giving a complete similitude of truth according to the original logical sequence of facts, and not in transcribing them, servilely, one after another, in the order of their successive occurrence.

(3) *Technique in the creative life.* Art is in a bad way when the artist forgets that he is a craftsman. After all, painting a picture and painting a table are not radically different tasks, as respects either performance or product. In each instance materials, tools, skills, and imagination are brought to bear upon each other according to determined conditions, for the sake of obtaining a desired product; and in each case both the activity and the product may be a fruitful source of satisfactions. Clearly the activities differ, since one is table-painting and the other picture-painting; but the differences are nevertheless matched by important similarities, and if the one activity is deserving of glory the other is deserving of respect. We should not be fatally wrong if we defined painting as "the art of using paint,"²² although we should, of course, need to know what we meant. Men are never stricken with works of art indiscriminately, as they might be with the plague or with lightning; it is only a poet who can dream a poem, as Coleridge dreamt *Kubla Khan*. And while poets may be born, poems are made; in a very real sense the *making* is the poem:²³

If a child has to fit together a jig-saw puzzle, it can learn to do it quicker and quicker. Theoretically indeed it requires no time to do it, because the result is already given. The picture is already created and the work of recomposing it can be supposed going faster and faster up to the point of being instantaneous. But to the artist who creates a picture, time is no longer an interval that can be lengthened or shortened. To contract it would be to modify the invention itself.

The time taken up by the invention is one with the invention itself. It is the actual living process of thought, a kind of vital process like *ripening*.

There are, however, artists who are eminently clever in handling their tools, but who unfortunately have nothing to say—"clever fellows . . . who might have been artists if painting had not absorbed all their energies, . . . forever setting themselves technical acrostics and solving them."²⁴ Technique is useful only as a means of embodying an aim—or, to put the statement the other way round, as a means of shaping matter. That it has no independent status is precisely the point of the foregoing quotation. There are no methods which are not methods *of* and *for*.

The technical point of view sums up only a part of the artistic enterprise. Technique centers around the possible; its primary concern is, "What will recalcitrant matter and inadequate instruments render feasible?" Imagination soars beyond the horizons set by technique, and by pure daring often converts the seemingly impossible into a fact. The relations between the two are especially apparent in architecture:²⁵

In Architecture, . . . the structure, the material form with all its technical problems, is, as it were, merely the substratum of the *spatial* forms which Architecture endeavours to produce and render effective. . . . A column, structurally, carries a load and is the transmission of a *downward* stress; spatially, it is a *rising* form. . . . While Building is the science of structure, Architecture is the art of three-dimensional optical illusions. The architect aims deliberately at the production (or correction of undesirable) optical spatial illusions by means of structural forms. . . . The same applies, *mutatis mutandis*, to Sculpture and all the other arts.

Technique has been analyzed by Bullough into: (a) Knowledge of the medium and its behavior; (b) familiarity with the tools for dealing with the material; (c) manual (motor) dexterity; (d) "technical memory"—the accurate persistence of the necessary adjustments over the requisite periods of time.

composer Strauss given on pp. 140-41. Frequently imaginative processes are unconscious. The mathematician, Poincaré, in a priceless psychological document has furnished an account of certain of his own discoveries in which his mind worked by both the coruscating and the underground method: ²⁶

It is time to penetrate deeper and to see what goes on in the very soul of the mathematician. . . . I beg the reader's pardon; I am about to use some technical expressions, but they need not frighten him, for he is not obliged to understand them. I shall say, for example, that I have found the demonstration of such a theorem under such circumstances. This theorem will have a barbarous name, unfamiliar to many, but that is unimportant; what is of interest for the psychologist is not the theorem but the circumstances.

For fifteen days I strove to prove that there could not be any functions like those I have since called Fuchsian functions. I was then very ignorant; every day I seated myself at my work table, stayed an hour or two, tried a great number of combinations and reached no results. One evening, contrary to my custom, I drank black coffee and could not sleep. Ideas rose in crowds; I felt them collide until pairs interlocked, so to speak, making a stable combination. By the next morning I had established the existence of a class of Fuchsian functions, those which come from the hypergeometric series; I had only to write out the results, which took but a few hours.

Then I wanted to represent these functions by the quotient of two series; this idea was perfectly conscious and deliberate, the analogy with elliptic functions guided me. I asked myself what properties these series must have if they existed, and I succeeded without difficulty in forming the series I have called theta-Fuchsian.

Just at this time I left Caen, where I was then living, to go on a geologic excursion under the auspices of the school of mines. The changes of travel made me forget my mathematical work. Having reached Coutances, we entered an omnibus to go some place or other. At the moment when I put my foot on the step the idea came to me, without anything in my former thoughts seeming to have paved the way for it, that the transformations I had used to define the Fuchsian functions were identical with those of non-Euclidean geometry. I did

not verify the idea; I should not have had time, as, upon taking my seat in the omnibus, I went on with a conversation already commenced, but I felt a perfect certainty. On my return to Caen, for conscience' sake I verified the result at my leisure.

Poincaré continues his story for a number of pages, showing how conscious work, coruscations or explosions of ideas, and the more underground unconscious processes of thought may coöperate in the solution of complicated problems. These processes are of common occurrence in the lives of ordinary people, though they take place on a less intense level and deal with more trivial subject matters. Artists, scientists, and ordinary people do not seem to differ in the general structure of their thought and feeling life, although the things they are concerned about and the apparatus and methods they employ to check and control their mental operations do differ widely.²⁷

It is the quality of the artist's own imaginative make-up, after all, that in the end determines his work. As Chardin put it, "What one paints with is not colors, but feeling"—and a little child expressed the same basic idea in the statement, "First I think, and then I draw a line around my think."²⁸

(5) *Why the artist creates.* According to the prevailing view, art originates in excess energy left over after more basic life necessities have been satisfied. Men first satisfy fundamental needs (this theory holds), and then in their spare moments, if they have any, turn to the production of objects of art. Reinach states the view thus:²⁹

Human industry is the outcome of need. . . . From the first dawn of humanity, man was obliged to fashion tools, weapons, and clothing, to provide himself with shelter against the fury of the elements and the attacks of wild beasts. He was industrious of necessity before he became an artist by choice. . . .

Art, in whatever degree it may manifest itself, appears to us under the dual aspect of a luxury and a diversion. . . . Man fashions a tool for his own use, but he decorates it to please his fellowmen, or to excite their admiration.

This absurd notion, expressed in many current works, might be called the tired-business-man theory of art. Whistler almost alone among recent writers energetically combats the idea:³⁰

In the beginning, man went forth each day—some to do battle, some to the chase; others, again, to dig and to delve in the field—all that they might gain and live, or lose and die. Until there was found among them one, differing from the rest, whose pursuits attracted him not, and so he stayed by the tents with the women, and traced strange devices with a burnt stick upon a gourd.

This man, who took no joy in the ways of his brethren—who cared not for conquest, and fretted in the field—this designer of quaint patterns—this deviser of the beautiful—who perceived in Nature about him curious curvings, as faces are seen in the fire—this dreamer apart, was the first artist.

Regarding both these accounts as parables or myths (and it is in this light that nearly all attempts to give origins must be regarded), Whistler's view is clearly more significant than Reinach's. However art may have originated, for the artist at least it is a basic need rather than a dispensable luxury or a plaything. Others may look upon art as they please; to the artist it is his life. He is an artist because his feelings and powers are vital things which drive through to expression by virtue of the unity of reflex arcs. It is better to search for the origins of art in the habit children have of drawing, or in the propensity of adults to scratch figures in the sand, because it pleases them to do so. Such explanations go deeper than do accounts which attempt to base art on the effort to please other persons after supposedly more fundamental needs have been satisfied. Many of the current views of art are simple corollaries of the fact that the modern man takes his pleasure after the day's work is done. We there see enjoyment functioning as a supplement to life, a relaxation after toil, an earned reward for intrinsically unsatisfying labor, rather than as a primary and indispensable feature of the operations that sustain life. We there see pleasure being hunted down, being

petitioned to make her appearance, being courted and lured to reveal herself—a thing which (shy maid) she seldom cares to do when thus besieged, though she will often sit down unbidden by a man's side when some task absorbs him and the hours fly. We there see life's consummations removed from her practical productive operations, so that recreations naturally become stupidly torpid or shamelessly stimulating; and we see people trying to be entertained rather than enjoying themselves. Where work is drudgery, leisure can only be devoted to recuperation from its strains or to the search for thrills, and little room is left either for genuine art or for healthy play. Under such conditions art is inevitably looked upon either as a plaything or as one of the luxurious appanages of leisure.

The cultural functions of the work of art

We have now completed the survey of the creative life of the artist which was initiated in order to arrive at an acceptable definition of art; it remains to analyze the completed work of art with a view to determining what functions it performs in the social order. When this has been done, it will be possible to frame a satisfactory definition of art, and it will then be seen that the term art when significantly used, covers many activities outside the range of the conventional fine arts.

The two chief qualities possessed by a great work of art are *charm* and *power*.³¹ By its charm we mean its ability to please; by its power we mean its capacity to give insight to illuminate and enlighten life. To the sensitive experiencer such a work offers intrinsic satisfactions, and these satisfactions are not offered but once to be consumed and destroyed, but many times over. The object lingers in the mind, enriching the experiencer with expanding significances which are based upon the values of the initial experience and grow out of it. When the painter succeeds in his intention—that of offering a significant reorganization of nature's visual and tactual possibilities—his work becomes a living thing capable of communicating successive increments of its own vitality to the experiencer. It can grow old

only when the conventions which underlie and determine its qualities are no longer relevant to living men.

Through a work of art we may to some small extent look into the mind of another human being. There is offered to us a world to explore, a universe to plumb, a mine of riches from which we may take what we can find, assured that in taking we do not deprive others of a similar right. Art is vicarious experience; when we view a magnificent still life by Chardin depicting simple copper pots with a singing resonant beauty, or when we listen to the piled-up rhythms, to the great ebb and flow of interwoven sounds of a symphony by Brahms, we feel not only that our life has been enlarged, but that it has been enlarged in an intended manner, and that we are traveling along a path that another human being has trod before us. Some critics have justly made much of this function of the artist—as for instance Roger Fry:³²

But in our reaction to a work of art there is something more—there is the consciousness of purpose, the consciousness of a peculiar relation of sympathy with the man who made this thing in order to arouse precisely the sensations we experience. And when we come to the higher works of art, where sensations are so arranged that they arouse in us deep emotions, this feeling of a special tie with the man who expressed them becomes very strong. We feel that he has expressed something which was latent in us all the time, but which we never realised, that he has revealed us to ourselves in revealing himself. And this recognition of purpose is, I believe, an essential part of the aesthetic judgment proper.

The social importance and possibilities of such bonds between artist and experiencer are obvious. Art can at once enlarge the horizons of our world and invest this enlarged world with more significantly shared purposes. Through the welcome intermediation of works of art we can view the pressures and turmoils of our own little lives with greater serenity, and achieve a more stable and satisfying existence.

It is a melancholy reflection upon the frustrations and monotony of ordinary life that to many people art stands as a symbol for escape from the world of actuality. The

artist is popularly supposed to be a dreamer, devoid of practicality and ineffectual in his dealings with fact; and works of art are praised (even by artists) for their lack of utility. It is natural, whenever man's productive activities and the enjoyments of life are imperfectly matched, for art, and in general all liberalizing activities, to be interpreted as means of evading realities. Art then becomes "the quickest way out of Manchester"³³ for those who can take it. This view of art is prevalent today. It has been as well expressed by the scientist Einstein as by any one:³⁴

"I agree with Schopenhauer," he said to Moszkowski, "that one of the most powerful motives that attract people to science and art is the longing to escape from everyday life, with its painful coarseness and unconsoling barrenness, and to break the fetters of their own ever-changing desires. Man seeks to form a simplified synoptical view of the world conformable to his own nature, to overcome the world by replacing it with his picture. The painter, the poet, the philosopher, the scientist, each does this in his own way. He transfers the centre of his emotional life to this picture, to find a surer haven of peace than the sphere of his turbulent experience offers."

However this may be, art has never flourished when disconnected from the rest of life—from religion, war, productive operations, or some other group enterprise. The whole course of art history reveals no instances of the efflorescence of artistic production apart from such communal activities. This, of course, is only a more generalized statement of the fact (established earlier in this chapter) that complete abstraction from nature is neither possible nor desirable in art. The artist cannot feed his own life with the spiritual materials necessary to his art. These he can receive only from outside himself, from the activities of his group and from the accepted interpretations of the world which his group offers him. These things form an indispensable part of the materials entering into a work of art. They are in fact just as necessary as the pigments, the canvas, or the artist's technical skill, for they constitute the data which make possible the artist's vision.

Critics are fond of commenting on the freedom from effort

or striving which characterizes the esthetic experience. In a pure esthetic experience there are no strains, no felt tensions, no distracting pushes or pulls. We are lifted up into the object, as it were, in completely satisfying absorption. A work of art must be capable of thus transporting us into itself, must create *psychical distance* in Bullough's pregnant phrase—not between us and the object, but between us-and-the-object and all other things. It is essential to remark, however, that the esthetic experience is not as effortless as it seems at the moment of enjoyment, for we are frequently surprised to find ourselves exhausted at the conclusion of the experience. The *rapprochement* between the funded purposes of the creative work and our own appreciative processes was so close that we were scarcely conscious of the fact that we were in a very genuine sense *re-creating* the object in experiencing it. It is not necessary to claim that the powers of the connoisseur are identical with those of the creator. The connoisseur, however, does need to possess powers, and he must exercise them vigorously in the course of an esthetic experience. A purely passive and inert approach to an object of art guarantees only boredom and frustration. One writer has represented the situation fairly well in the following words: ³⁵

The aesthetic attitude may be likened to rowing downstream with the current and following all its windings. One is here active in that one moves with the stream, but passive in that one opposes no resistance to the force which is carrying one on.

There is, in short, a coöperation between the object and the experiencer, in which both furnish materials supplementing and enlarging one another. The situation involves a fruitful interaction, rather than a passive reception on the one hand and an active giving on the other.

Definition of art in the light of the preceding analysis

From the preceding data on the creative life of the artist and on the cultural functions of the work of art, it should be possible to gain some notion respecting the meaning of art. Limitations of space and competence make it impos-

sible for us to scan all of the recognized fine arts in order to determine their intrinsic characteristics, and hence our attention has been confined almost entirely to painting. It is in the light of art as a way of life, to the creator and to the appreciator, that we now venture to define that much-vexed term.

Art in both its phases—*i.e.*, as creation and as the experiencing of works already created by others—may be defined as *activity in which process and product mutually interpenetrate and determine each other*. We have genuine art whenever an activity yields simultaneously a product and a pleasure that are inextricably interwoven; when the same experience functions both as productive—as leading to things outside itself—and as consummatory—as existing for its own sake. A work of art sums up the past and points to the future, as it were, with one complete and satisfying gesture. Any process is artistic in which means and ends mutually affect each other, so that activities and aims do not work at cross purposes, but interact and coöperate at every point in determining the result. A great work of art is a production that is not easily exhausted of its active powers, but contains within itself the ability to furnish ever new consummations, so that it is not a mere dead existence but a living center of satisfying energies. In artistic activity, whether of the creating or of the appreciating type, there is no division of labor as between production and consumption. The producer consumes and the consumer produces at one and the same time; there is a full harmony of activity and result. Artistic creation is not magical, nor is it devoid of moving power; the esthetic experience is not a commerce in obvious and easily won satisfactions, nor is it sterile: in both creation and re-creation there is fruitful labor, productive satisfaction.

Professor Dewey almost alone among contemporary writers has grasped this point. The following quotation presents his view of the matter: ³⁶

Arts that are merely useful are not arts but routines; and arts that are merely final are not arts but passive amusements

and distractions, different from other indulgent dissipations only in dependence upon a certain acquired refinement or "cultivation." . . . Distinctively fine art . . . occurs when activity is productive of an object that affords continuously renewed delight. This condition requires that the object be, with its successive consequences, indefinitely instrumental to *new* satisfying events. . . . A consummatory object that is not also instrumental turns in time to the dust and ashes of boredom. The "eternal" quality of great art is its renewed instrumentality for further consummatory experiences. When this fact is noted, it is also seen that limitation of fineness of art to paintings, statues, poems, songs and symphonies is conventional, or even verbal. Any activity that is productive of objects whose perception is an immediate good, and whose operation is a continual source of enjoyable perception of other events exhibits fineness of art.

Beyond question our culture has in times past been greatly enriched by the arts eulogistically called "fine"—by music, poetry, sculpture, painting, and architecture, with their subsidiary arts—but obviously these activities are distinguishable in no essential particular as arts from other activities to which the name (in its commendatory sense) has been denied. Many human vocations of extremely diverse natures exhibit the characteristic quality of the fine arts—that of being fruitful, satisfying experiences; of joining production (utility) and consumption (satisfaction) in mutual interdependence. This is true, for example, of most pursuits in scientific investigation; of a good deal of man's tinkering with tools; of not a few sports and recreations; of the discourse of friends; of many of the enterprises of thought; of much moral activity; etc. On the other hand, the arts we call "fine" certainly have very little else in common, and taken together form a rather curious group. Architecture today is really an industrial art, though we call it one of the fine arts. Prose literature is excluded from our canon, possibly because early literary productions were always cast in poetic form. In short, our list of the fine arts gives every indication of being purely conventional, and of not depending upon any inherent characteristics of

these activities sufficient to set them off from other features of our culture. Nature frequently paints a picture on her own account; form and function may so coöperate in a machine as to command esthetic approval; a mathematical proof or a scientific demonstration is capable of yielding the noble pleasures of art; nor is the life of religion and of morals totally cut off from these experiences. Finally, in other cultures than our own arts standing entirely outside our favored list are considered "fine." Thus calligraphy and archery were highly esteemed by the Chinese, the ritual of tea drinking by the Japanese, hand dancing in Siam.

Great harm is done to art when it is made to appear esoteric and capricious, a thing reserved for only a minute few, appropriate only to the sanctuary where it is worshiped, the rich man's gallery where it stands as the emblem of caste and prestige, or the public museum where it figures as a puzzle or a curio. Yet artists and critics sometimes willfully contribute to the general mystification, as in statements like the following:³⁷

Let the artist's function grow profounder rather than more extensive. Let the forms which he discerns and the symbols in which he incorporates their qualities be sufficiently remote from the imagination of the vulgar to prevent the truth which they convey from assuming a general character. . . . Too great lucidity is unfitting: let us beware of masterpieces. Decorum demands a certain degree of dimness, and decorum is one of the attributes of art.

One can imagine an artist leaving his work more obscure than he would like because his vision had overpowered him and given him whereof to speak he had not the means (*cf.* Dante in his more mystical passages), but this is far other than the gratuitous introduction of decorous dimnesses into one's artistic productions in order to keep them from the common herd.

Much of esthetic theory has been of a sort that not only excluded the vulgar public from any possibility of participation in the life of art, but even read previously accredited artists out of the fold. Little but good can come from new

ways of looking at art;* but harm results when these new insights arrogantly attempt to displace older though still valid appreciations. It is one of the abiding richnesses of great art that it can be all things to all men and yet ever remain itself.

In all strictness it might be asserted that there is no such thing as art, though there are many arts. Music or painting, for example, are not names of single enterprises, for we know little or nothing about a man's work when we are told merely that he composes or paints. In art, style or manner is everything. Beethoven, Brahms, Tchaikovsky, Wagner, and Debussy were really engaged in doing different things, although they all happen to have written music for the orchestra. The work of each one of them reveals its intimate connections with the culture patterns of its day, and is clearly not out of time and space; in this respect their work is as closely united to the activity of other artists and to the general life of the times as it is to the musical tradition. Only a baffled experience can result if one attempts to listen to Debussy as one would listen to Tchaikovsky.

Current confusions regarding art

We shall now list and criticize two or three popular but mistaken meanings given to art. Without attempting to survey the ground of common usage exhaustively, the following meanings may be named as among the more prevalent confusions that cluster around this word and color its uses:

(1) Art is often taken to include any product or result of human activity, as contrasted with the operations of nature acting apart from man's intervention; anything that man must make rather than find—using this term in the broadest sense. According to this view, man leaves his mark wherever he goes, and the marks of man's presence in the world constitute art. This usage has significance only if man is

* Thus Mark Twain enlarged our views when, being asked if he liked books, he replied that he certainly did, for a thin volume would keep a table from wobbling, a leather-covered book was useful as a razor strop, while a heavy tome could always be shied at a cat.

placed above and outside of nature—if, for example, he is regarded as the proper citizen of a supermundane realm, forced to sojourn for a time in the alien and unfriendly surroundings of this meager world. It fatally separates man from the world in which he is inextricably imbedded, and it ignores the fact that art has an occasion, a subject matter, and an embodiment—that it draws its raw materials from the world, and depends for its effects upon the natural powers of things and of persons. The materials and the forces of human action are natural through and through.

Nature is made better by no mean,
But nature makes that mean: so, over that art
Which you say adds to nature, is an art
That nature makes.³⁸

Representatives of the view that severs art from nature sometimes go to the extreme of separating art, not only from nature, but from all social connections as well:³⁹

To appreciate a work of art we need bring with us nothing from life, no knowledge of its ideas and affairs, no familiarity with its emotions. . . . The connections of one work of art with another may have everything to do with history; it has nothing to do with appreciation. So soon as we begin to consider a work as anything else than an end in itself, we leave the world of art.

Such a notion crumbles into nonsense when one considers how works of art are made. They are not bred mysteriously out of purely private stuffs; they draw their basic materials from the common store, and develop conformably to the culture pattern. Just as the process of creation must always have its prosaic setting and connection with life and the world, so also the activities of appreciation, merely because they occur in a human being, are inalienably involved in the complex interpenetration of forces, natural and social, that constitutes our life.

(2) When art is not contrasted with nature, it is often regarded as synonymous with skill or contrivance, or, somewhat more narrowly, with dexterities connected with the

pursuit of known ends. It is in this sense that Colvin uses the term: ⁴⁰

[Art includes] every regulated operation or dexterity whereby we pursue ends which we know beforehand; and it means nothing but such operations and dexterities.

This usage has a long tradition behind it, dating back to the Greeks; one of the dictionary definitions of art is "the adaptation of things in nature to the uses of life." Art is undoubtedly primarily active rather than passive, both as respects creation and appreciation, but the attempt to equate art with manipulation or contrivance has unfortunate effects both for art and for other activities. In art such a view obscures and minimizes the importance of imagination and insight, and thereby leads one in the discussion of the fine arts to over-rate (for example) the technical excellence of a painting, at the expense of its imaginative content, or to praise unduly its fidelity to nature, notwithstanding the fact that it may be barren of expressive significance. Elsewhere, this view renders sterile and static one's notions of thought, science, morals, and other pursuits by divorcing them from the methods by which they are advanced. The person who looks on art as method will almost of necessity regard science as a body of settled facts, rather than as a body of methods, a human effort, or a way of regarding the world. If art be defined as practice or doing, science is usually put down as theory or knowing—to the great confusion of both these pursuits.

Beyond question men employ techniques to shape the objects they find before them nearer to their desires, but the important thing here is the precise nature, animus, and bearing of each technique. Such matters can better be determined by viewing them in relation to their subject matters than in connection with other skills. The man who should set himself the task of studying technique in general—not the technique *of* . . . , but just technique—would surely be forced to make much ado over nothing. Methods can best be understood and evaluated when they are sur-

veyed *in situ*, in connection with their functioning. Their relevance is then seen to be special rather than general. It is in this fashion that we have endeavored to study art.

(3) Art is often regarded in a third way, not as human activity in general, nor yet as skill and contrivance, but as production which is not practically motivated, but which aims entirely at the attainment of intrinsic satisfactions. Colvin's excellent statement of this point of view runs as follows: ⁴¹

The word Art, becoming appropriated to the fine arts, has been treated as if it necessarily carried along with it, and as if works to be called works of art must necessarily possess, the attributes of free individual skill and invention, expressing themselves in ever new combinations of pleasurable contrivance, and seeking perfection not as a means towards some ulterior practical end but as an ideal end in itself.

When the term is given this meaning, the useful or practical arts are definitely contrasted with the fine arts—*i.e.*, with those which are thought of as containing ends or purposes within themselves.* It is a matter of interest in this connection that Santayana in his *Reason in Art*, although he has defined art more broadly, devotes nearly all of his attention to the fine or liberal arts, giving only a single chapter to the industrial arts and explicitly placing them in subservience to the arts called fine: ⁴²

Art has accordingly two stages: one mechanical or industrial, in which untoward matter is better prepared, or impeding media are overcome; the other liberal, in which perfectly fit matter is appropriated to ideal uses and endowed with a direct spiritual function. . . . Industry merely gives nature that form which, if more thoroughly humane, she might have originally possessed for our benefit; liberal arts bring to spiritual fruition the matter which either nature or industry has prepared and rendered propitious.

A curious division of labor this!—one harking back, of course, to the dualism between man and nature indicated

* That this view is faulty we have already shown in our analysis of the nature of art.

by the first definition discussed in this section, and one made still more curious when we are immediately informed: ⁴³

All industry contains an element of fine art and all fine art an element of industry. . . . Before the product can attain its ideal function many obstacles to its transparency and fitness have to be removed. A certain amount of technical and instrumental labour is thus involved in every work of genius, and a certain genius in every technical success.

The candor of these sentences is disarming, but they point irresistibly to the bankruptcy of the view that fine art is purely consummatory—is entirely the purveyor of nonproductive, “ideal” satisfactions.

How did this notion of a purely consummatory art ever gain currency? Santayana himself answers the question, when he states that his view that some arts are servile may be regarded as the modern analogue of Aristotle’s dictum that some men are natural slaves.⁴⁴ In our culture, as in that of Greece, many people are merely workers, so far at least as their economic status is concerned, while others are merely enjoyers, members of a leisure class. In ancient Greece the distinction between efficient and final causes, between means and ends, between servile production and liberative contemplation of life’s final goods, was developed because a large class of slaves performed most of the labor connected with actual production, leaving their masters free for passive enjoyment: ⁴⁵

Because Greek industry was so largely upon this plane of servile labor, all industrial activity was regarded by Greek thought as a *mere* means, an extraneous necessity. Hence satisfactions due to it were conceived to be the ends or goods of purely animal nature in isolation. With respect to a truly human and rational life, they were not ends or goods at all, but merely “means,” that is to say, external conditions that were antecedently enforced requisites of the life conducted and enjoyed by free men, especially by those devoted to the acme of freedom, pure thinking. As Aristotle asserted, drawing a just conclusion from the assumed premises, there are

classes of men who are necessary materials of society but who are not integral parts of it.

Today, however, upon the same premises, we do not conclude that some men are slaves, but merely that some arts are servile.

None of the three views of art we have criticized does full justice to art considered as a way of life. No way of life can be divorced from nature, nor can a way of life be composed merely of productive operations or of consummations—for thus we may summarize the three views that have been presented. Those who hold the first view place the artist outside of his world, and thereby deprive him of his raw materials and his inciting problems; those who, forgetting that artists are men of imagination, define art in terms of skill or techniques, of productive operations, deny the artist his inspirations and his visions; while those who regard art as consummation deny the artist his labors, and thus come near to viewing art as magic or as manna dropped from heaven.

Work, play, and art

In summary and conclusion, it may be well to state explicitly the meanings it seems advisable to give to work, play, and art. By work we mean activity engaged in for the sake of some external end, by play, activity engaged in for its own sake,* by art, activity in which means and ends mutually interpenetrate and determine each other. When a man labors in order to earn his daily bread, he is working; when he labors for the pure fun of it, he is playing; and when his labors are such that there is an intimate and continuous connection between what he does and the satisfactions that accrue, so that each organically determines the other, he is an artist. A thoroughly satisfactory world would be one in which all men did nothing but play, and in which all men were artists. Such a world would no doubt contain much absolutely irrelevant and unmotivated spontaneity, both of exuberant release (as when one leaps shouting into

* This definition, often given for art, fits play admirably.

the air for the pure joy of living) and of passive submission (as when one basks idly in the summer sun); but whenever it aimed at accomplishing anything it would turn naturally to the processes of productive-consummatory art. Play and art between them would guarantee a good life.

REFERENCES

- ¹ W. F. Dearborn, *The Psychology of Reading, An experimental study of the reading pauses and movements of the eye. Arch. of Philos., Psych., and Sci. Methods*, No. 4 (March, 1906).
- ² Max Eastman, *Enjoyment of Poetry* (N. Y., Scribner's, 1913), 74.
- ³ Osvald Sirén, *Essentials in Art* (London, Lane, 1920), 5.
- ⁴ Clive Bell, *Art* (N. Y., Stokes, 1913), 64-65.
- ⁵ Josef Strzygowski, *The origin of Christian art, Burl. Mag.*, Vol. 20 (1911-12), 150.
- ⁶ Sirén, 73-74.
- ⁷ F. M. Cornford, *From Religion to Philosophy, A study in the origins of western speculation* (N. Y., Longmans, Green, 1912).
- ⁸ *Iliad*, Book I, end; trans. by Lang, Leaf, and Myers (London, Macmillan, 1911).
- ⁹ Alessandro della Seta, *Religion and Art, A study in the evolution of sculpture, painting, and architecture*. Trans. by M. C. Harrison (London, Unwin, 1914), esp. 374-375.
- ¹⁰ Exodus, Chap. 20, verse 4.
- ¹¹ Strzygowski, 150.
- ¹² S. Reinach, *Apollo, An illustrated manual of the history of art throughout the ages*. Trans. by F. Simmonds (new ed., N. Y., Scribner's, 1909), 124.
- ¹³ William Zorach, *The new tendencies in art, The Arts*, Vol. 2 (1921-22), 13; W. H. Wright, *Modern Painting, Its tendency and meaning* (N. Y., Lane, 1915), 18-19.
- ¹⁴ Edward Bullough, *Mind and medium in art, Brit. Journ. of Psych.*, Vol. 11 (1920-21), 28.
- ¹⁵ For a clear presentation of the nature of our visual stimuli, see H. C. Warren, *Human Psychology* (Boston, Houghton Mifflin, 1919), 160-183.
- ¹⁶ G. L. Raymond, *The Essentials of Æsthetics in music, poetry, painting, sculpture, and architecture* (3 ed., N. Y. Putnam's, 1921), 371-372.
- ¹⁷ Sirén, 38.
- ¹⁸ See Adolf Hildebrand, *The Problem of Form in Painting and Sculpture*. Trans. by Max Meyer and R. M. Ogden (N. Y., Stechert, 1907), esp. Chap. 1.
- ¹⁹ Hildebrand, 41.
- ²⁰ Zorach, 10.
- ²¹ Guy de Maupassant, *Introd. to Pierre et Jean*.
- ²² Charles Marriott, *Modern Movements in Painting* (London, Chapman and Hall, 1920), 1.
- ²³ T. E. Hulme, *Speculations, Essays on humanism and the philosophy of art* (N. Y., Harcourt, Brace, 1924), 196.
- ²⁴ Bell, 40.
- ²⁵ Bullough, 36.
- ²⁶ Henri Poincaré, *The Foundations of Science*. Trans. by G. B. Halsted (N. Y.,

Science Press, 1921), 382-394 (Book I, Chap. 3, of *Science and Method*). The quotation is from pp. 387-388.

²⁷ Graham Wallas, *The Art of Thought* (N. Y., Harcourt, Brace, 1926)—a book which appeared after the above had been written—offers valuable corroboration of the position I have elaborated.

²⁸ Roger Fry, *Vision and Design* (N. Y., Brentano's, n. d.), 96.

²⁹ Reinach 1-2.

³⁰ J. McN. Whistler, *The Gentle Art of Making Enemies, as pleasingly exemplified in many instances, wherein the serious ones of this earth, carefully exasperated, have been prettily spurred on to unseemliness and indiscretion, while overcome by an undue sense of right* (London, Heinemann, 1890), 139.

³¹ Cf. A. C. Barnes, *The Art in Painting* (N. Y., Harcourt, Brace, 1926).

³² Fry, 30.

³³ C. K. Ogden, I. A. Richards, and James Wood, *The Foundations of Aesthetics* (London, Allen and Unwin, 1922), 39.

³⁴ Quoted in Havelock Ellis, *The Dance of Life* (Boston, Houghton Mifflin, 1923), 321-322.

³⁵ H. S. Lauzfield, *The Æsthetic Attitude* (N. Y., Harcourt, Brace, and Howe, 1920), 60.

³⁶ John Dewey, *Experience and Nature* (Chic., Open Court, 1925), 361, 364-365. See the whole of Chapter 9, which was extremely helpful in enabling me to arrive at the point of view stated above. The first sentence of the passage quoted (as well as some others in the chapter) suggest a disparagement of play that I do not share.

³⁷ Albert Gleizes and Jean Metzinger, *Cubism* (London, Unwin, 1913), 24-25.

³⁸ Shakespeare, *A Winter's Tale*, Act 4, Scene 4, Lines 90-93.

³⁹ Bell, 25, 102.

⁴⁰ Sidney Colvin, *Fine Art, Ency. Brit.* (11 ed.), Vol. 10, 356.

⁴¹ Sidney Colvin, *Art, Ency. Brit.* (11 ed.), Vol. 2, 660.

⁴² George Santayana, *Reason in Art* (N. Y., Scribners, 1905), 32-33.

⁴³ Santayana, 33.

⁴⁴ Santayana, 24.

⁴⁵ Dewey, 369.

Chapter XVII

SCIENCE

Science a historical phenomenon

Obvious difficulties beset the study of science as a cultural phenomenon, for to many it is the chief flower and glory of our life. The nature and significance of science cannot be discussed with the same calm interest that one might conceivably employ in analyzing the scholastic philosophy, the Greek view of the state, or the religious notions of the Black-foot Indians. We are easily tempted to credit science with all certain control over truth, in our zeal forgetting that there exist, today as always, other avenues to valid certainty; and we often speak of the impartiality, thoroughness, and carefulness of the scientific investigator as if he alone among men possessed these traits, thereby doing great injustice to the many individuals in all ages who have striven valiantly, and with some success, to attain these rare qualities. Science, it cannot be too often repeated, is distinguished from other human activities by its cultural or institutional features—by its methods and procedures, rather than by its graces of spirit or absolute validity. It is true, no doubt, that modern science has a magnificent and uplifting tradition behind it, but this fact makes it only the more necessary, for the purposes of understanding, to study it as a portion of the culture pattern. The scientific temper of mind is itself the product of a long period of indoctrination and habituation, and to be appreciated must be seen as the end result of training rather than as an ethical quality possessed out of hand. Personal aptitude is, of course, essential to scientific success, but no amount of honesty, open-mindedness, persistence, etc., apart from the scientific tradition could hope to add much to the sum of scientific knowledge.*

* F. M. Cornford in discussing Thucydides points out that he could not possibly entertain "a scientific view of history." "Rather he took the view of one who, having an admirably scientific temper, lacked the indispensable aid of accumulated and

To trace the history of science, showing at the same time when every prominent feature of the modern enterprise first became culturally significant and in just what respects it depended upon and grew out of human nature, would indeed be a fascinating undertaking. We shall have to content ourselves here with the more modest task of describing a few of the features of contemporary scientific activity. It is important to remember, however, that science has had a history.² In its modern form, it has grown up since the middle ages—Roger Bacon, a 13th-century contemporary of the great medieval theologian, St. Thomas Aquinas, was perhaps the earliest of its prophets, in that he advocated the joint use of the experimental and the mathematical methods. It was hardly before the 16th or 17th century—in the great days of Copernicus, Kepler, Galileo, Descartes, Newton, Harvey, Boyle, and Huygens—that the new endeavor was thoroughly established. Modern science was not an entirely new development, however. It owes a heavy debt to the Greek mathematicians and investigators whose activity centered around Alexandria in Egypt during the three or four hundred years before and after the beginning of the Christian era. Of these Hellenistic scientists perhaps the best known are Euclid, Archimedes, and Ptolemy, but there was a host of others, and their work provided a great mine of suggestion and inspiration for the early fathers of modern science. Even when the modern scientists found it necessary to attack the Alexandrians (as when Copernicus offered his heliocentric theory in place of Ptolemy's geocentric hypothesis), they must often have felt that they were bound more closely to these ancients in interests and in fundamental approach to nature than they were to the philosophical theologians of their own day.

systematic knowledge, and of the apparatus of scientific conceptions, which the labour of subsequent centuries has refined, elaborated, and distinguished. Instead of this furniture of thought, to the inheritance of which every modern student is born, Thucydides possessed, in common with his contemporaries at Athens, the cast of mind induced by an early education consisting almost exclusively in the study of the poets. No amount of hard, rational thinking—an exercise which Thucydides never intermitted—could suffice to break up this mould, in an age when science had as yet provided no alternative system of conception.”¹

Science has not retained precisely the same attitudes and aims throughout its history. Like all living things, it has been subject to the law of change. Some features of its development will become apparent in the course of this chapter. Nor has science always and everywhere enjoyed the high prestige which is today its portion. Even at the present time, although nearly every one is deeply influenced by its existence in our culture, and although many are aware of this fact, few persons possess in any high degree the scientific temper of mind. In its earlier days science was made the butt of many a barb of satire from literary man and cleric,³ and even today not a few artists, poets, and divines view its achievements with ill-concealed alarm as a direct attack upon beliefs they hold dear. What the members of other cultures are likely to think of science is beautifully indicated by the following letter, which was written by a Turkish *cadi* in answer to a request for certain statistical data:⁴

My Illustrious Friend, and Joy of my Liver!

The thing you ask of me is both difficult and useless. Although I have passed all my days in this place, I have neither counted the houses nor inquired into the number of the inhabitants; and as to what one person loads on his mules and the other stows away in the bottom of his ship, that is no business of mine. But, above all, as to the previous history of this city, God only knows the amount of dirt and confusion that the infidels may have eaten before the coming of the sword of Islam. It were unprofitable for us to inquire into it.

O my soul! O my lamb! seek not after the things which concern thee not. Thou camest unto us and we welcomed thee: go in peace.

Of a truth thou hast spoken many words; and there is no harm done, for the speaker is one and the listener is another. After the fashion of thy people thou hast wandered from one place to another, until thou art happy and content in none. We (praise be to God) were born here, and never desire to quit it. Is it possible, then, that the idea of a general intercourse between mankind should make any impression on our understandings? God forbid!

Listen, O my son! There is no wisdom equal unto the belief

in God! He created the world, and shall we liken ourselves unto Him in seeking to penetrate into the mysteries of His creation? Shall we say, Behold this star spinneth round that star, and this other star with a tail goeth and cometh in so many years! Let it go! He from whose hand it came will guide and direct it.

But thou wilt say unto me, Stand aside, O man, for I am more learned than thou art, and have seen more things. If thou thinkest that thou art in this respect better than I am, thou art welcome. I praise God that I seek not that which I require not. Thou art learned in the things I care not for; and as for that which thou hast seen, I spit upon it. Will much knowledge create thee a double belly, or wilt thou seek Paradise with thine eyes?

O my friend! if thou wilt be happy, say, There is no God but God! Do no evil, and thus wilt thou fear neither man nor death; for surely thine hour will come!

The meek in spirit (El Fakir)

IMAUM ALI ZADI.

The aim of science

The very life of science lies in the methods and devices by which it is advanced, but these can the better be understood if one is already familiar with its purpose. This can briefly be stated as *the generalized and systematized description of natural phenomena*. Science aims at the description of things, but not at their description in their living, throbbing idiosyncrasy. Where the poet seizes one horn of the dilemma, and attempts to communicate his experiences through intensely realized particular instances, the scientist has grasped the other, and seeks to state what he has learned through organized systems of general propositions. Nowhere, perhaps, has the rationale of this endeavor been better presented than by Poincaré: ⁵

We can not know *all* facts, since their number is practically infinite. . . . That a choice must be made is incontestable; whatever be our activity, facts go quicker than we, and we can not catch them; while the scientist discovers one fact, there happen milliards of milliards in a cubic millimeter of his body. To wish to comprise nature in science would be to want to put

the whole into the part. . . . It is needful that each of our thoughts be as often useful as possible, and this is why a law will be the more precious the more general it is. This shows us how we should choose: the most interesting facts are those which may serve many times; these are the facts which have a chance of coming up again. We have been so fortunate as to be born in a world where there are such.

Given a great maze of ever accumulating data and the impulse to describe them, one might (in sheer desperation and as a practical measure) attempt to reduce them to manageable form by grouping them (generalization) and by grouping the groups (systematization).

This is what is meant when men say that science deals with "laws." The laws of science are in one remarkable respect like the laws of our legal codes—they are statements of tendencies rather than of absolute facts. Thus it may be written in our statute books that a certain crime is punishable with death; but this does not mean that death follows inevitably upon the commission of the crime. The offender must first be caught, convicted, and executed before the law becomes the statement of a fact. And yet, when a good criminal code is well administered, there is a strong tendency for this to happen. In just the same way scientific laws are not statements of absolute truths, but of habits or trends of nature. No actual falling body ever precisely illustrated the formula for gravitation, but through the use of this formula we are able to approximate more closely than by any other known means to the general features peculiar to *all* cases of falling.

Another way of stating the matter is to say that science deals with ideal cases. The scientist studies individual instances of gravitational phenomena, but he studies these instances in order to find out something about gravitation considered generally. He aims at a statement of the law of falling bodies, rather than at a description of the way this particular bit of material fell. He is not content to write a history of the different fallings of a block of wood which shall be true in every detail, but through the use of a block of wood he may try to arrive at a general law which shall

be applicable to all fallings whatsoever. This law need not be precisely and completely exemplified by any particular case; the law is the statement which best sums up all the cases that have come under the scientist's cognizance.

It is evident that this aspiration of the scientist for generalized and systematized knowledge not only leads him to different *conclusions*, but also requires him to have different *experiences* from those of his nonscientific friends. His life will be differently ordered and arranged because of his aim. We have already contrasted him with the poet who is anxious to realize as intensely as possible a particular experience. This effort of the poet when successful yields a species of knowledge quite different from that attained by the scientist. In a somewhat similar fashion Poincaré contrasted the kind of knowledge that interests a historian* with that which concerns a scientist:⁶

Carlyle has somewhere said something like this: "Nothing but facts are of importance. John Lackland passed by here. Here is something that is admirable. Here is a reality for which I would give all the theories in the world." . . . That is the language of the historian. The physicist would say rather: "John Lackland passed by here; that makes no difference to me, for he never will pass this way again."

Our everyday perceptions, as for instance the sight of a friend or the hearing of a noise, are also essentially unscientific, although they furnish us with knowledge and indeed are the bases upon which scientific investigation rests. Science is possible only because we hear, see, feel, etc., and the final test of all scientific generalizations is their ability to interpret and organize these more primary experiences. Finally, craft knowledge no less than perceptual knowledge lies outside of science, though it too is affected by the existence of systems of scientific generalizations. Just as we see many things without an appeal to ultimate principles, so we know how to do many things in the same unanalytic and pragmatic manner. Scientific investigation

* Perhaps after all this is but one of the varieties of knowledge of interest to the historian.

is therefore but one of the ways of obtaining valid data concerning the world. The imaginative insight of the poet, the reconstructive genius of the historian, the perceptual operations of ordinary life, and the craft activities centering around manipulations and skills, all provide knowledge. Scientific knowledge is to be distinguished from these other varieties of knowledge by its generalized and systematized character.

The methods of science

It is through an understanding of the methods of science, however, that statements concerning its aims obtain their full meaning. Historically the methods were developed first, and are responsible not only for the data but also for the ideals of science; so that it would be reasonable to define that pursuit in terms of the methods scientists employ in conducting their investigations. From this point of view science may be regarded as *the controlled observation of natural phenomena under coöperative conditions for the purpose of obtaining exact (and preferably mathematical) statements regarding natural processes*. In this descriptive definition at least three topics stand in need of analysis and discussion: (1) the place of mathematics in science; (2) science as controlled observation of natural phenomena; (3) science as a coöperative endeavor. In the following sections these topics will be treated as indicative of the methodic predilections of modern science.

(1) *The place of mathematics in science.* The efficacy of the mathematical approach to nature constitutes a standing paradox. How does it happen that this discipline, seemingly so abstract and unearthly, helps human beings to understand natural processes? A disembodied intelligence, floating idly through space, who by some odd chance should happen to dream out Euclid's system would never suspect that this construction based on points without dimensions, lines without breadth, and planes without thickness could ever be of the slightest relevance to the stodgy, solid world in which we live. He would, no doubt, credit himself with another poetic

creation, marvelous in its systematic features but utterly removed from the possibility of practical application. So too if he should imagine the number system, with its curious and ever puzzling relations between its members, its various incommensurables, imaginaries, infinities, and the like, he would be little inclined to suppose that the inhabitants of a world like our own could ever have found it valuable in increasing their knowledge of natural events.

When we think of mathematics, we have in our mind a science devoted to the exploration of number, quantity, geometry, and in modern times also including investigation into yet more abstract concepts of order, and into analogous types of purely logical relations. The point of mathematics is that in it we have always got rid of the particular instance, and even of any particular sorts of entities. . . . So long as you are dealing with pure mathematics, you are in the realm of complete and absolute abstraction. All you assert is, that reason insists on the admission that, if any entities whatever have any relations which satisfy such-and-such purely abstract conditions, then they must have other relations which satisfy other purely abstract conditions.⁷

The edge of the paradox we are discussing—that of the applicability of mathematics to an understanding of our world—is removed for many minds because they very inadequately appreciate the great abstractness of mathematics. They do not realize that the geometrician, in proving his propositions, claims to be discoursing of nothing that ever was on land or sea; that the arithmetician, when he states that $2+2=4$, asserts a certain relation between perfectly abstract concepts which would still hold if two *things* could never be added to two other *things* without creating a fifth *thing*, or without combining to form a single *thing*. No matter how *things* may combine, $2+2=4$ because of the meaning which the mathematician has given to 2, +, =, and 4.

Nearly all of the great past triumphs of science have come when it has followed the lead thus laid down by mathematics. This is why science is animated by the passion for generalized and systematized knowledge. No other disci-

pline compares with mathematics in generality and system—in abstraction and order—and the scientist, inspired by the successes of the mathematician, is dissatisfied when he cannot present his results in a commensurably generalized form.

There is one great difference, however, between mathematics and science. Every mathematical system rests upon certain postulates or assumptions which are simply taken for granted without proof, and from which the rest of the system follows with strict logical rigor. Thus the following are among the more important postulates of the Euclidean geometry:

- (1) Between any two points there can be drawn a unique (*i.e.* a straight) line.
- (2) About any point as a center, circles can be drawn.
- (3) Through a given point outside a straight line, there can be drawn but one parallel to that line.

These postulates (as well as the others of the Euclidean system) are not proved; they are taken for granted: but everything else in that system is proved. Now to the mathematician it is a matter of perfect indifference whether his postulates are applicable to the conditions under which we happen to be living. They need only be fruitful with interesting implications—with implications, that is to say, which are interesting for mathematical reasons, and not by virtue of their applicability to the explanation of natural phenomena. And so mathematicians develop not one geometry but many, much ingenuity being devoted to making each geometrical system a purely formal construction of the creative imagination. The scientist, on the other hand, either wishes the postulates upon which he bases his mathematical reasonings to accord with observed occurrences, or he desires that the implications which flow from his postulates shall do so. Ideally, of course, both the postulates and the implications should be verifiable in this sense, but, as we shall see when the subject of hypothesis is discussed a few pages farther on, such double verification is not considered absolutely necessary.

We may therefore regard much of science as composed of special cases drawn from the more general field of mathematics. Out of all of the abstract systems offered by the mathematician, it is the privilege of the scientist to utilize those which best accord with his needs. He can do this because science, being the child of mathematics, looks at phenomena from fundamentally the same point of view as its parent—from the point of view, that is to say, of measure and number, of quantity and spatial relations. Mathematics, as we have seen, is not a single great abstract system, but a congeries of systems based upon a great variety of different and often contradictory postulate groups; and it is therefore not so surprising, after all, if some of these formal creations should prove useful to the scientist in his effort to generalize nature's processes. The relevance of much of mathematics to the scientist's task is further guaranteed by two facts: (1) the first and most basic generalizations of mathematics were developed to facilitate eminently practical operations (in connection with commerce, the setting up of boundaries between estates, the paying of taxes, etc.) and still retain at least the remnants of dependence on their empirical bases; (2) scientists themselves are frequently mathematicians, and proceed to invent the abstractions they need if they do not already exist.

So strongly does the investigation of natural processes push in the direction of mathematical statement that many writers deny the name of science to studies which have not as yet submitted to quantitative attack. This view rests on the conviction that exact statements which are capable of generalization are necessarily mathematical in form. At the present time, however, it must be admitted that many studies which are clearly scientific in intent and in result are only slightly dependent on mathematical formulations. This is notably the case, for example, with the work of geologists and paleontologists in reconstructing the past in exact and generalized form. Only the simplest measuring and counting operations are of use in determining the order of deposition of the sedimentary rocks or the historical relationships between fossil remains, and yet these studies

are indubitably scientific. Mathematics therefore does not constitute an absolutely indispensable organon of scientific research, although as a matter of fact the exact study of nature's general habits has been very greatly facilitated by mathematical deduction. Even within the field of physics much valuable work has been nonmathematical in nature, as for instance Faraday's great researches in electricity.

(2) *Controlled observation in science.* A great deal of scientific research is limited almost entirely to observation, to watching pure and simple. This is particularly the case in astronomy, in geology, and in social studies, where the nature of the materials makes experimental manipulation practically impossible. The astronomer attempting to determine the distance of *alpha Centauri* from the solar system or conducting investigations into the constituents of the sun's atmosphere, the geologist studying the order of deposition of sedimentary rocks laid down perhaps millions of years ago, or the sociologist trying to trace the connections between poverty and crime, simply have certain data spread out before them which they must use as best they can. Like the little boy at the circus, they must take things as they come, and see what they can in the phantasmagoria which is offered them.

And yet scientists are not so likely to be confused in the face of Dame Nature's great show as little boys are at the circus. In the first place, they do not try to see everything at once. The little boy's eyes almost burst from the strain of keeping track of all three rings and the clowns and the trapeze performers and the acrobats and the elephants and the peanut vendors and the crowd and everything—it is now or never for every clamorous experience, and so the lad drinks them all in indiscriminately. The scientist knows that he can observe the same phenomenon over and over again (or if he cannot, he subdivides the task of watching, as we shall see), and he recognizes the importance of concentrating attention on some one problem during each observation. He does more than merely use his eyes; he directs them at a particular point in order either to see what is there revealed or to determine if some supposition which he has

constructed to fit the situation is true. This at once raises the question of the function of hypotheses in scientific research—a question which will be discussed shortly.

In the first place, then, the scientist does not disdain the use of ordinary undirected observation when no better resource is at hand. Scientists like other men keep their eyes open, and many discoveries of the first importance have been casually made.

There are not a few cases where almost pure accident has undoubtedly determined the moment when a new branch of knowledge was to be created. The true laws of the construction of crystals were not discovered until Haüy happened to drop a beautiful crystal of calc-spar upon a stone pavement. . . . In attempting to join the fragments together, he observed regular geometrical faces, which did not correspond with the external facets of the crystals. . . . The very existence of the so-called galvanism, or electricity of low tension, was unsuspected until Galvani accidentally touched the leg of a frog with pieces of metal. The decomposition of water by voltaic electricity is also said to have been accidentally discovered by Nicholson in 1801, and Davy speaks of this discovery as the foundation of all that had since been done in electro-chemical science.⁸ *

Such happy chances, however, are usually not the end but the beginning of scientific labors. They present and define a task more often than they conclude a research. They are not so much answers to problems as leads or hints of possible answers—suggestions offered to the investigator by nature that he need never have heeded had his not been the ready and the fertile mind.

The scientist, then, concentrates his observations by looking for one thing at a time; he repeats his observations whenever he can; he does not close his eyes to chance suggestions; he makes use of hypotheses (to be discussed shortly). Further, and this is very important, he depends as much as possible on instruments.

* W. S. Jevons, *The Principles of Science*, 162-4. Copyright, 1874, by The Macmillan Company. Reprinted by permission.

The use of instruments in scientific research. Many writers on scientific method make a distinction between observation and experiment as these operations figure in scientific investigation. As a matter of fact, however, scientific observation is more nearly allied to experimentation than it is to the casual observation of ordinary life. The scientist bridges the gap between these two procedures by the use of instruments. An experiment is usually described as an observation under deliberately arranged conditions; but the astronomer studying an eclipse certainly does not conduct his observations at haphazard. He works in concert with other astronomers according to carefully worked-out plans, and he places full reliance wherever possible on instruments. True, he does not control the goings and the comings of the sun, and he cannot rapidly accumulate observations at a speed set only by his personal inclinations; but such things are hardly sufficient to determine a basic difference in scientific method. It rests with the particular problems under investigation to determine in each specific instance whether "observation" shall be more or less fruitful than "experiment." In general it may be said that either process is successful in proportion as instrumentation is possible.

Instruments do more than extend the range of our contact with natural processes, as by opening up the world of the very small or the very large (*e.g.*, the microscope and the telescope), by recording what might otherwise escape notice (*e.g.*, the phonograph record or the photographic plate), by enabling us to make very fine adjustments (*e.g.*, calipers and chronoscopes), etc. Important as such matters are for the facilitation of research—by merely turning his telescope on the planet Jupiter, Galileo was able to see a miniature solar system in operation combating the theories of the Aristotelian opponents of Copernicus—instruments are still more important for the qualities they impart to the results obtained by them.

Let us discuss this point with reference to the measurement of heat. In the first place, thermometers give more exact heat records than human subjects. To us a room may feel warm or cool according to the temperature of the place we

have just left or according to our health; and in addition we are not capable of making the fine thermal discriminations that are necessary for scientific research. Further, a thermometer turns the amount of heat into a number, so that the temperatures of different phenomena can be readily compared. This comparability of the results may seem like a small matter, but it makes generalization much easier—and this, as we have seen, is a prime desideratum with the scientist. In order to generalize with safety, numerous instances of the phenomenon being studied are necessary, and the results obtained must of course admit of comparison. Finally, the use of instruments makes it possible for other investigators to test the results. They can employ the same apparatus with the same or other techniques and see for themselves whether the conclusions are sound. Instruments can be devised to leave continuous records of what has happened during the course of the experiment, or they can be set in such a way as to guarantee that the experiment shall take place under predetermined and controlled conditions. Thus with a thermostat the temperature can be maintained at a predetermined level throughout a given investigation.

The thermometer illustrates but one type of scientific instrument. Scientists make constant use, not only of mechanical apparatus, but also of ideational devices and tools. The various ideas and principles of mathematics furnish more than a means of stating scientific conclusions. They also constitute part of the paraphernalia of research. Much scientific work would be hindered or even rendered impossible without the help of this great tool, with its many ramifications and special parts. Outsiders who are not quite thoroughly indoctrinated in scientific method sometimes find it a little difficult to understand the attitude of the scientist towards his basic conceptions. These notions are employed for what they are worth, for the access to new data and new generalizations that they promise, rather than for the sake of their actual truth or validity. This is only another way of saying that they are used *instrumentally*—somewhat as a man employs a tool to help him get something that he wants, without bothering to ask himself

whether this is exactly the proper and accredited way to use the device which lies ready to his hand.

A history of science written in terms of its dependence on its instruments would go far towards revealing the dynamics of scientific advance. Only one factor—that associated with the theoretical or mathematical approach—begins to compare with this in determining the direction of scientific development. Of the two early pioneers of the new scientific order, Copernicus (1473-1543) depended mainly on mathematical analysis and Tycho Brahe (1546-1601) on detailed observation. The former, that is to say, used mathematical conceptions as instruments for the understanding of nature,* whereas the latter preferred quadrants, chronometers, and the like. The one laid the main theoretical foundations of the new astronomy, the other through his magnificent observations furnished that science with the means for its self-correction and development. Kepler spent no less than twenty-five years in the study of Tycho Brahe's records. In 1609 and 1619 he published his famous laws of planetary motion—laws depending through and through on observation rather than on mathematical theorizing. And then (final triumph of theory!) Newton in 1687 showed that these empirical laws could be deduced from a single abstract generalization.

Practically all of the advances in astronomy and physics in this century and a half from Copernicus to Newton rest upon the development of scientific instruments. It is significant that the great age of physical science, in the late seventeenth and early eighteenth centuries, followed hard

* That this is no exaggeration of Copernicus' position can be seen from the following quotation from the preface of his *De Revolutionibus Orbium Celestium*: "The object of the astronomer is to put together the history of the celestial motions from careful observations, and then to set forth their causes or hypotheses about them, if he cannot find the real causes, so that these motions can be computed on geometrical principles. But it is not necessary that his hypotheses should be true, they need not even be probable; it is sufficient if the calculations founded on them agree with the observations. . . . Let us therefore add the following new hypotheses to the old ones, as they are admirable and simple, but nobody must expect certainty about astronomy, for it cannot give it; and whoever takes for truth what has been designed for a different purpose, will leave this science as a greater fool than he was when he approached it." 9

upon the invention, during the early years of the seventeenth century, of many indispensable devices. Among these were the telescope (placed on sale in Holland as a toy in 1609, and reinvented by Galileo from a description); the compound or two-lens microscope (early 17th century; Malpighi used it in 1661 to establish the fact that blood passed from arteries to veins, although it was not until the first quarter of the 19th century that really good microscopes were available); the micrometer (invented about 1639 by Gascoigne to permit the delicate adjusting of telescopes); the thermometer (used in an early open-top form by Galileo about 1600, although the mercury thermometer did not appear until 1670); the barometer (Torricelli, 1643); the slide rule (Gunter, 1624); the pendulum clock (Huygens, 1657); etc.

Among the most fruitful of these seventeenth century inventions was the barometer, an instrument which can easily be constructed by immersing a glass tube some three feet long and sealed at one end in a mercury bath, and then raising the sealed end until the tube stands in the vertical position. The mercury will fall in the tube to a level determined by the weight of the air column it displaces.

This invention or discovery of Torricelli's was one of the most fertile ever made, for at one blow it demolished the ancient superstition that "nature abhors a vacuum," explained very simply two ancient puzzles (why water rises in a pump, and why it rises only 33 feet), determined accurately the weight of the atmosphere, proved it possible to make a vacuum, and gave to mankind an entirely new and invaluable instrument, the barometer.¹⁰

The seventeenth century also witnessed the invention of many mathematical devices or conceptual tools—including logarithms (Napier, 1614), analytical geometry (Descartes, 1637), the development of the theory of probability (Fermat and Pascal), the calculus (Newton and Leibniz), etc.—but enough has probably been written to indicate the close connection between science and its instruments. Even the machine tools which were discussed in Chapter X

(see especially pp. 210-213) are of importance for scientific research, for they have made it possible to manufacture instruments of the highest precision. One writer goes so far as to state that "the screw-cutting lathe is as important an instrument of knowledge as the differential calculus." ¹¹

A strong case, then, could be made for limiting the term science to the attempt to study nature through the use of instruments, provided this term were understood to include two things: (a) instruments of observation, employed in order to refine and correct the declarations of our senses; (b) mathematical devices and conceptions, employed to array, synthesize, and generalize the materials provided by instruments of observation. Wherever it is difficult or impossible to employ both types of tools, science advances only with great difficulty. This is particularly the case, for example, in the study of social phenomena. While these can be interpreted statistically, practically all such treatments to date are mere descriptive summaries of the data—useful for the sake of conciseness in presentation, but hardly important as leading to general laws. In the gathering of data the social sciences must still in large measure depend on literary methods rather than on instruments; and in their abstract interpretation they have as yet arrived at no principle comparable in importance to the law of gravitation, the ether hypothesis, the theory of electrons, or the doctrine of evolution. Sociology has not yet given birth to its Newton or its Darwin, and so it remains a confused congeries of dissociated facts and surmises, organized loosely under illogical and often mutually conflicting categories.

The use of hypotheses in scientific investigation. This long section on controlled observation as a feature of science will be concluded with a discussion of the functioning of hypotheses. Here perhaps as much as anywhere does the real genius of science best appear, for we here see disciplined and put to use (without emasculation or deterioration of its possibilities) one of man's least controllable powers—his imagination. It should pay us to study this matter

with some little care, for we are here close to the very heart of science.*

An hypothesis may be defined as *an imagined explanation of a given state of affairs which is used to guide observation and research*. The first thing to note is that the scientist brings a mind to his studies. He does not approach nature as so many writers have all but said, completely devoid of all interests and prejudgments, his mind a mere blank sheet of paper upon which nature is expected to inscribe her laws. The investigator must accost her with a specific query on his lips, or he will probably learn nothing; and this query in many instances constitutes his major contribution to his research. The scientist does not so much draw laws out of nature as make her a gift of them.

It is an attractive notion that in an investigation we should start with no presuppositions about the state of things to be discovered but with perfectly open minds and a single eye to the facts. There is a fine Baconian smack about it. One thinks of Darwin examining the facts for fifteen years (or whatever the period was) before framing his hypotheses. In fact it is all in the sound English tradition, . . . [but it] is all nonsense. Darwin must have had some sort of hypothesis or he would not have known what facts to examine. There were millions of facts and he could not attend to them all. To have an open mind is not the same thing as to have a vacant mind. The vacant mind is like the bottomless pit; no amount of facts will ever fill it. What is absolutely necessary is that the investigator should not allow any hypothesis to give him a bias against the facts. Apart from this the more hypotheses he has the better.¹²

The scientist may obtain his hypotheses in any way he sees fit; they may depend on the penetration and fertility of his imagination, on his knowledge of the subject, on suggestions from the outside through reading or conversation, on the accidents and chances of the laboratory—he may even dream them or steal them, but without them he is

* Cf. the discussion that follows with that given on pp. 138-144 of the relations between aimless and purposive thinking.

helpless.* The mere occurrence of guesses or suggestions, however, is an extremely common phenomenon whenever human beings are faced by a puzzling situation. The scientist must learn to put his guesses to the test. Does this view of his, this guess or this fond hope, actually prove fruitful when it is taken seriously and given a chance to justify itself by the results that flow from its application in the course of research? Only when guesses are treated in this manner, as genuine guides and directors of further investigation, do they deserve the name of hypotheses.

It follows from the above that a vigorous imagination is no disadvantage in scientific work, but rather a great asset, if only the investigator allows it free rein whenever he examines the problems that concern him, but relentlessly requires each of its happy guesses and wild surmises to yield its full fruitage of fact before he lets it go. As Faraday once wrote in his laboratory book respecting a certain notion he was entertaining: ¹³

All this is a dream—still examine it by a few experiments. Nothing is too wonderful to be true, if it be consistent with the laws of nature; and in such things as these, experiment is the best test of such consistency.

At another time in writing of the activity of the scientist he said: ¹⁴

The world little knows how many of the thoughts and theories which have passed through the mind of a scientific investigator, have been crushed in silence and secrecy by his own severe criticism and adverse examination; that in the most successful instances not a tenth of the suggestions, the hopes, the wishes, the preliminary conclusions have been realized.

From the standpoint of the functions they perform in scientific investigation, hypotheses may be regarded as mental instruments for obtaining controlled observations. Scientific observation is not the random watching of nature

* In Chapter VII an attempt was made to analyze the conditions under which thoughts occur in terms of the stream of experiences, the existence of affective states, and the recession of the stimulus.

as she goes through her paces; it is rather a directed search for certain things which one for some reason expects to find. Scientific instruments are not devices for recording everything that happens under given conditions; they are tools for securing trustworthy and communicable data regarding specific matters which the scientist has come to suspect are decisive in a particular situation. Everywhere hypothesis is structural and determining. It is seldom enough for an investigator to inquire, in a given instance, "*What is happening here?*" He must usually ask, "*Is this happening?*" The best scientist is the one who asks the most pregnant specific questions, and then devises the most conclusive and clear-cut means of answering the questions that he asks.

Science makes use of two rather different kinds of hypotheses, which we may christen and describe as follows:

(a) *Experimental hypotheses*. These are developed in connection with efforts to solve a particular problem, and are of such a nature that their validity can eventually be tested. Thus if one is moved to determine why mother of pearl is iridescent, a number of different suggestions for the solution of the problem will eventually present themselves, and it then becomes necessary to devise means of testing such of these hypotheses as seem most likely to be true. Suggestions which are not open to verification will be discarded, and conclusive tests of the other hypotheses will be essayed. Is the iridescence determined entirely by the peculiar chemical composition of the shell? If so, we may expect to find it occurring in all shells composed of the same materials; but this proves not to be the case. Is it in part due to the substance of which the shell is composed? This cannot be so, for other materials are similarly iridescent. Is it, then, due to the peculiar surface qualities of the iridescent substances? This is shown by experiment to be the case, since the colors are transferred to wax, balsam, fusible metal, lead, isinglass, etc., when impressions are taken of the iridescent substance.

Hypotheses of the experimental type are developed *ad hoc*, in order to deal with a particular problem, and their

value is determined by their success in enabling the investigator to solve his difficulty.

(b) *Organizing hypotheses.* These hypotheses bind together a group of otherwise scattered data into a more or less organized system. Without them, we should be acquainted only with a large number of unassociated and disjointed facts; thanks to such hypotheses, these facts are organized and grouped so that they mutually illuminate each other. Since organizing hypotheses are usually unverifiable, they can be judged only by their fruitfulness and by their freedom from confusing implications. They are valuable according as they further research and lead to the discovery of additional facts, but they can hardly be called true.

The Copernican theory constitutes a superb example of an organizing hypothesis. As compared with the Ptolemaic theory it is not true; it is simply more convenient. The motions of the heavenly bodies can be represented more simply by referring them to the sun than they can by referring them to the earth—that is all. The results of astronomical investigation lead us to believe that the actual motions of the heavenly bodies are much more complex than those indicated by either theory.

Science exhibits many organizing hypotheses, but perhaps the prime example is the ether notion, which enjoys the rather peculiar distinction of contradicting, dilemmatically, the very data which it is invoked to organize into a system. The following quotation summarizes the situation:¹⁵

A material medium is necessary for the transmission of sound, but a hot body such as the filament of an incandescent lamp can emit heat and light when it is in a vacuum. Between the sun and the earth there is no matter, in the ordinary sense, since no opposition to the motions of the planets and comets can be detected. But it is usually thought inconceivable that there should be waves where there is no medium. Hence Huygens suggested that there is a medium, the *ether*, filling all space and interpenetrating all matter, and that light consists of the vibrations of this medium.

But, if this medium exists, nothing definite is known of it

except that it transmits radiation which . . . consists of transverse waves. If it is an elastic medium the velocity of transverse waves in it is equal to $\sqrt{E/D}$, where E is its transverse elasticity or rigidity and D its density; and, since the velocity of light is enormously great, either E is very great or D is very small. If E is very great, the medium is practically rigid, and it is difficult to see how the planets and comets can move freely through it. If D is very small, the ether is much less dense than any gas, and it is not easy to understand how it can have rigidity at all.

Because of these difficulties some prefer to give up all reference to the ether and simply regard the transmission of radiation as being a property of space itself. This is a distinction in words without much difference in meaning. Until the controversy as to this is settled, it will be better to retain the idea of the ether, at least as a convenient means of expressing the property space has of transmitting radiation.

And yet, as Bumstead points out, this highly contradictory notion has proved extremely fruitful in suggesting and controlling research: ¹⁶

Many of the most important discoveries, mathematical and experimental, have arisen from attempts at its solution. It at once stimulated the mathematical study of the theory of elastic solids and of the applicability of this theory to the phenomena of light. The work of Cauchy, Green, McCullagh, Stokes, and Kelvin in this field may be said to have created a new era in mathematical physics and even in mathematics itself.

The use of organizing hypotheses undoubtedly has its dangers, even when they continue to prove fruitful. Developed in the first instance to simplify the interpretation of natural phenomena, they may end by forcing us to develop a more complex system than we might otherwise have achieved. Let us suppose that we start with an inadequate organizing hypothesis, which is nevertheless capable for a time of ordering nature more satisfactorily than anything that we can devise. It will lead to new discoveries, but, being inexact, will require complicated formulations. These

formulations in turn will be used in making further discoveries, which will be still more complicated—and so the matter may continue until the whole scientific system becomes excessively intricate and unwieldy. It will then be as full of rules and exceptions as traditional Latin grammar, and it will not be easy for investigators to make further advances. Nor will it be easy for them to substitute another organizing hypothesis for the one that thus proves unsatisfactory, for reasons suggested in the following quotation:¹⁷

The scientific heritage into which the modern investigator enters consists of collections of facts and of statements of theories. It is not sufficiently recognized that these two elements are virtually inseparable. Consciously or unconsciously, all facts observed and set down have reference to some notion, hypothesis, or theory. It follows that, while all scientific work is based on "facts"—things specified as known to have occurred or to be true—the accumulation of facts as such does not constitute science. Actual scientific inquiry begins, not with "learning" what is already known of a particular subject, not with the collection of materials, but with the perception of some difficulty in current explanations of phenomena.

The organizing hypotheses, by virtue of their being so completely interwoven into the facts, can easily become doctrines to be accepted as true irrespective either of their fruitfulness or of the simplicity and order they introduce into the scientific system. When this happens, they no longer function as instruments for furthering research, but become ends in themselves, intrenched and irresponsible. As the subtleties developed around an organizing hypothesis increase, its value declines.

Summary. In this section we have been discussing controlled observation as a central method of science. We attempted to distinguish it from mere watching, though it was pointed out that the scientist has no scruples against taking advantage of casual observations; we showed how the scientist uses instruments, whether mechanical or mathematical, to further his researches; and we discussed hy-

potheses as devices for the imaginative guidance of observation, in this connection distinguishing experimental from organizing hypotheses. These matters of circumspect observation, instrumentation, and hypothesis are basic to the scientific enterprise.

(3) *Science as a coöperative endeavor.* One great reason for the success of science lies in the fact that scientists have devised methods for the coöperative conduct of their investigations. In philosophy as in many other pursuits, although the fact that the workers depend on each other is evident enough, little use has been made of the principle of the division of labor, and each man starts in over again at the very beginning. There is always need for a resurvey of fundamentals; but there is also need for the advancement of knowledge. It is interesting that Francis Bacon, one of the early prophets of science, was fully aware of the advantages of coöperative endeavor in the scientific field:¹⁸

Touching impossibility, I take it that all those things are to be held possible and performable, which may be done by some persons, though not by every one; and which may be done by many together, though not by one alone; and which may be done in the succession of ages, though not in one man's life; and lastly which may be done by public designation and expense, though not by private means and endeavour.

Newton also gave expression to the same view when he said, "If I have seen farther than Descartes, it is by standing on the shoulders of giants."

Science is strong and powerful because scientists divide their labors, because the works of scientists are cast in such a form as to be communicable to other investigators with minimum loss, and because scientists entirely as a matter of course pour their labors into the common fund. Soddy, the great English investigator in the new chemistry of radioactive substances, makes the following remarks in this connection:¹⁹

Amid all the sneers at the impracticability and visionary character of communist schemes, let it not be forgotten that

science is a communism, neither theoretical nor on paper, but actual and in practice. The results of those who labour in the fields of knowledge for its own sake are published freely and pooled in the general stock for the benefit of all. Common ownership of all its acquisitions is the breath of its life. Secrecy or individualism of any kind would destroy its fertility.

It is worth noting that the communism of science does not destroy individual initiative or eliminate the importance of genius, as many opponents of socialism have argued must necessarily be the case under communistic conditions.

Scientific societies have played a large part in the history of science. Among the first devoted largely to scientific advance was the *Academia Secretorum Naturae*, founded at Naples in 1560 by della Porta, which required candidates for admission to present a discovery in natural science as an indication of their qualifications. The *Accademia dei Lincei* (it had a lynx for its insignia), founded at Rome in 1603, numbered Galileo among its members, and is still in existence. The Royal Society of London was definitely incorporated in 1662, although savants had been meeting together since about 1645; the *Académie Royale des Sciences* was organized at Paris in 1666; the *Akademie der Wissenschaften* at Berlin in 1700; and the "American Philosophical Society Held at Philadelphia for Promoting Useful Knowledge" in 1760 with Franklin as its presiding officer. These organizations have done much to advance the cause of science. Recent developments analogous to the founding of the academies we have just listed include the endowing of great organizations for research (such as the Rockefeller Foundation) and the creation by governmental bureaus (such as our Department of Agriculture) of trained staffs of special investigators.

Another important factor in rendering science coöperative was the invention of printing from movable type, which was known to the Chinese for many hundreds of years before it was taken up by Europeans, during the second quarter of the 15th century (by Coster in Holland and Gutenberg in Germany). A generation elapsed, however, before the new

method became at all common. "Printing was practiced in Rome in 1467, in Paris in 1470, in Spain in 1474, and in England in 1477. . . . The first press in the New World was established at the city of Mexico in 1544. . . . The first press in the British colonies of North America was set up at Harvard College in 1639." ²⁰

Science could be carried on only with great difficulty without the aid of the printing press. The specialization of tasks renders it absolutely imperative that scientists acquaint themselves with the activities of their coworkers if they are to apply their energies effectively. Even today, with the great flood of books, memoirs, periodicals, special reports, summaries of the literature, indexes, etc., there is great danger of isolation, not of individual scientists, but of whole groups of investigators engaged in some special task which draws them away from their fellow-workers. As the amount of preparation and training required to engage in creative work in any special scientific pursuit increases, there is a strong temptation to ignore the connections of this specialized activity with allied studies. This can only lead in the end to sterility, for no narrow line of research can continue for a long time to fertilize itself. The printing press can do much to keep such workers in contact with their fellows.

Every scientist publishes his investigations knowing that other scientists will scrutinize them with the greatest care, that his coworkers will be eager to pick out logical flaws, statistical inaccuracies, experimental ineptitudes, and unwarranted conclusions in his results, and that his reputation will in large measure depend upon his ability to run this formidable gauntlet. Is it to be wondered, under such conditions, if his attitude should not usually be tentative and hesitating, except when he is certain that he possesses an absolutely water-tight case—and if, also, the more personal and delightful elements of individuality and charm should often be carefully excluded from his productions?

The scientific attitude or temper of mind as it exists today is thus largely a corollary of the methods of science that have traditionally been developed in the course of the history of that subject. They are especially an offshoot of the

bias towards exact or mathematical statement, the animus towards controlled observation, and the utilization of co-operative methods. It is these features of scientific endeavor, too, which give significant meaning to the effort of scientists to obtain a generalized and systematized knowledge of natural processes.

The functions of science

It remains to discuss the part played by science in our life. What immediate and primary satisfactions accrue to the scientist as he engages in his endeavors? What values attach themselves to science considered as a body of generalized and systematized knowledge? To what uses can science be put in the life economy? How does the existence of science affect the man on the street? It is to such questions that we now turn.

Perhaps the chief personal satisfaction to be derived from scientific pursuits comes from gratification of the desire to know. It is curiosity—"most active during infancy and adolescence, and customarily repressed in most of us, but irrepressible in idiots, gossips, and men of science,"²¹—that drives men to study nature. It is related of Clerk Maxwell, the English physicist, that when he was a little boy he was often heard to ask, "Yes, but what is the particular *go* of it?" The great force back of nearly all scientific endeavor has rather been the desire to know than the desire to control. Though knowledge is power, the greatest power associated with knowledge in many instances is that which comes merely from knowing.

Science also satisfies the incurable bias of the human mind for order by offering a settled and systematic interpretation of natural phenomena. This is not to say that science is static, for nothing could be farther from the facts. "There is nothing in the world as ephemeral as scientific theory, nothing so musty and ancient as old scientific theory. Nobody but a man of science could ever have invented the phrase 'merely of historical interest.'"²² But at the same time, while new facts are discovered and added to the body of science, and while old theories are displaced and pass

away into the limbo of history, the essential picture that science presents of the world remains very much the same, and it is a picture of order, of harmony, and of law.

Many souls are therefore content to rest their faith in science, very much as yet other souls put their trust in the deliverances of theology. Few of us are willing to wander without guide or signpost through the maze of facts, and in our day assurance that all is well is increasingly guaranteed by science. There is this great and puzzling difference between science and theology, however, that while science is held to be justified by her fruits when she is forced to change her doctrines, theology is regarded as discredited when the pressure of facts leads her to attempt a revision of her dogmas. Perhaps the point of the paradox here suggested is removed, however, when we note that science herself usually corrects her mistakes, whereas the mistakes of theology are most frequently discovered by others—and especially by scientists.

Poets are too little appreciative of the esthetic possibilities of the scientific world-view. The great pictures, magnificent metaphors, superb perspectives, the glorious sweep and fire of the world as science conceives it—idealizes it, we had almost said—have given private satisfaction to many a worker; but they have seldom been caught up and eternalized in art. "The fundamental and ancient impressions are of the world-power, of the immensities, of the pervading order, and of the universal flux. To these modern science has added impressions of manifoldness, inter-relatedness, and evolution."²³ What themes await the great poet of science that may some day be born! No poet will ever have lived in a larger world than he, nor in one which at the same time contains more variety and a sublimer order—

All things by immortal power
Near or far,
Hiddenly
To each other linked are,
That thou canst not stir a flower
Without troubling of a star²⁴

—it will be his privilege and glory to sing of the boundless abundance of the stellar spaces, to limn the tiny hidden worlds within the atom, to catch the restless, eager, never-ceasing surge of things, to make us pause in wonder before eternal law; his words will tread the measures of the cosmic dance of star with star, and all his utterance will speak forth in moving unison with nature's complex harmonies.

It is to be feared, however, that science stands for little or nothing of this in the mind of the man on the street. To him the scientist is likely to figure either as a strange necromancer who by mysterious manipulations pulls electric lights, telephones, automobiles, and airplanes out of his hat, or as an eccentric fellow who potters away at useless tasks, harming nobody, it is true, but doing no one any good. With no sense of the connections joining theoretical and applied science, and with absolutely no sound notions of scientific method—thanks to the forbidding wall of technicality scientists have themselves erected around their magnificent building, when they should have been content with a removable scaffolding—the average man has little understanding and much awe of science. Of course, the coinage of science need not be debased in order to enable it to pass current in the market place; but scientists might well consider it a privilege to attempt the translation of their more recondite findings into the common speech. It is a matter for commendation that efforts in this direction have not been lacking, although it must be admitted that comparatively few people are as yet equipped to understand even such a work as the recent *Outline of Science*.

Even though the average man imperfectly recognizes it, however, he has been affected by pure science, and in two ways—through changes in himself and through changes in his world. The notions of cause and effect that he uses as a matter of course in daily life, as well as many other settled habits and disciplines of his mind, are faint and wavering reflections of the fact that the average man lives in a world that has been stabilized by science. That this is the case can be realized by comparing his stock of notions with those entertained by persons living under a theological rather

than a scientific order. The average man of today may not know that to every action there is an equal and opposite reaction, but he usually substitutes for the axiom, "The Lord will provide," some view approximating a little more closely to the scientific dictum. He still has his superstitions and his fancies, as has also the scientist himself, but he also does his thinking in terms of notions that are distantly related to the mechanical-mathematical structure of the world elaborated by contemporary science. His contact with the machines that science has placed in his environment also gives him an inkling of the impersonality and indifference to human concerns which modern science attributes to nature. He is more likely to give a horse a personal name than he is to christen an automobile. In many ways, though usually without his knowing it, his world has been depersonalized and otherwise rebuilt more nearly in accord with the ideals of science.

It remains to point out that science has increased man's control over nature. The word "control" here must not be misunderstood; in our sense of the term man controls poison gases if he can make them, even though he insists on using them to destroy his fellows. Whether for good or for ill, the advance of chemical science has put this power in his hands. Bacon was right; knowledge is power—not wisdom, but power. Thanks to the development of science, more power is available to the modern man than to any other man in history. Sometimes it seems as though he commands this power in about the same way that he commands the hurricane that tosses him about.

We owe most of the discoveries which have given us this control over nature to pure science—to science, that is to say, which was engaged in without the thought of practical applications. This is indicated in the following quotation: ²⁵

Some time ago the votes of the readers of an American periodical—*Popular Mechanics*—were taken as to what inventions were considered to be the "seven wonders of the modern world." From a list of numerous inventions, seven had to be selected; and those which received the highest number of votes were: wireless telegraphy, the telephone, the aeroplane,

radium, anæsthetics and antitoxins, spectrum analysis, and X-rays. Each one of these things had its foundations in purely scientific work and was not the result of deliberate intention to make something of service to humanity. . . . A scientific investigator working in a laboratory was in every case the originator of the fact or principle utilised in the production of what a consensus of opinion considers to be the seven greatest achievements of modern times. *

The study of conic sections was pursued for nearly two thousand years without the slightest indication of practical applications, until suddenly, in the early days of astronomical science, it became of importance to daily life: ²⁶

The discovery of the conic sections, attributed to Plato, first threw open the higher species of form to the contemplation of geometers. But for this discovery, which was probably regarded in Plato's time [4th century, B. C.] and long after him, as the unprofitable amusement of a speculative brain, the whole course of practical philosophy of the present day, of the science of astronomy, of the theory of projectiles, of the art of navigation, might have run in a different channel; and the greatest discovery that has ever been made in the history of the world, the law of universal gravitation, with its innumerable direct and indirect consequences and applications to every department of human research and industry, might never to this hour have been elicited. †

Faraday was once demonstrating the induction of an electric current in a coil of wire upon its being suddenly introduced into the field of a magnet—the foundation principle of the dynamo or electric generator, with all of its manifold applications—when a lady asked him, “But what is the use of it all?” Faraday replied, “Madam, will you tell me the use of a new-born child?” Again, on being asked the same question by Gladstone, his answer was, “Why, sir, there is every probability that you will soon be able to tax it!” Faraday was absolutely right; when the new-born

* Richard Gregory, *Discovery*, 235-6. Copyright, 1916, by The Macmillan Company. Reprinted by permission.

† J. J. Sylvester, in Moritz, *Memorabilia Mathematica*, 104. Copyright, 1914, by The Macmillan Company. Reprinted by permission.

child of theory becomes a grown-up man, he is often taxed for the benefit of a once unappreciative world.²⁷

REFERENCES

- ¹ F. M. Cornford, *Thucydides Mythistoricus* (London, Arnold, 1907), ix-x.
- ² Among the more easily available histories of science, W. T. Sedgwick and H. W. Tyler, *A Short History of Science* (N. Y., Macmillan, 1917), and Walter Libby, *An Introduction to the History of Science* (Boston, Houghton Mifflin, 1917) may be singled out for mention. F. W. Westaway, *Scientific Method, Its philosophy and its practice* (2 ed., London, Blackie, 1919), contains interesting historical chapters on scientific method.
- ³ For an example (from Oliver Goldsmith), see F. B. Strong (ed.), *Lectures on the Methods of Science* (Oxford, Clarendon Press, 1906), 38-39.
- ⁴ Quoted in William James, *The Principles of Psychology* (N. Y., Holt, 1890), Vol. 2, 640-641.
- ⁵ Henri Poincaré, *The Foundations of Science* (N. Y., Science Press, 1921), 362 (from Book I, Chap. 1, of *Science and Method*).
- ⁶ Poincaré, 128 (from *Science and Hypothesis*, Chap. 9).
- ⁷ A. N. Whitehead, *Science and the Modern World* (N. Y., Macmillan, 1926), 31-32.
- ⁸ W. S. Jevons, *The Principles of Science, A treatise on logic and scientific method* (N. Y., Macmillan, 1874), Vol. 2, 162-164.
- ⁹ Quoted in Sedgwick and Tyler, 200-201.
- ¹⁰ Sedgwick and Tyler, 257.
- ¹¹ A. D. Ritchie, *Scientific Method, an inquiry into the character and validity of natural laws* (London, Paul, Trench, Trübner, 1923), 3-4.
- ¹² Ritchie, 104.
- ¹³ Jevons, Vol. 2, 236-237.
- ¹⁴ Jevons, Vol. 2, 222-223.
- ¹⁵ A. W. Duff, *College Physics* (N. Y., Longmans, Green, 1925), 221.
- ¹⁶ H. A. Bumstead, in L. L. Woodruff (ed.), *The Development of the Sciences* (New Haven, Yale Univ. Press, 1923), 60.
- ¹⁷ F. J. Teggart, *Theory of History* (New Haven, Yale Univ. Press, 1925), 162.
- ¹⁸ Francis Bacon, *De Augmentis Scientiarum*, Book II (in J. M. Robertson's ed. of Bacon's philosophical works, London, Routledge, 1905, 425).
- ¹⁹ Frederick Soddy, *Science and Life, Aberdeen addresses* (London, Murray, 1920), 2-3.
- ²⁰ International Encyclopedia (2 ed., N. Y., Dodd, Mead, 1917), Vol. 19, 215-216.
- ²¹ F. S. Marvin (ed.), *Science and Civilization* (Oxford Univ. Press, 1923), 14.
- ²² Ritchie, 14.
- ²³ J. A. Thomson, *Introduction to Science* (N. Y., Holt, 1911), 101.
- ²⁴ Francis Thompson.
- ²⁵ Richard Gregory, *Discovery, or The spirit and service of science* (N. Y., Macmillan, 1916), 235-236.
- ²⁶ J. J. Sylvester in R. E. Moritz, *Memorabilia Mathematica, or The philomath's quotation-book* (N. Y., Macmillan, 1914), 104.
- ²⁷ These anecdotes are from Gregory, 2-3. Pasteur used the former story in his 1854 inaugural address at Lille, crediting it to Benjamin Franklin; see René Valléry-Radot, *The Life of Pasteur*, trans. by Mrs. R. L. Devonshire (N. Y., Garden City Publ. Co., 1926), 76.

Chapter XVIII

RELIGION

Diverse components of the religious life

Although few persons have been entirely denied first-hand acquaintance with the great complex of forces and attitudes we call religion, it is not easy to see clearly how the various components of the religious life are related to each other. We know, for example, that Christianity goes back, through a long and varied past in which it has meant many things to many men, to a certain individual who once lived in Palestine, and from whom it gets its name; but we realize that this individual was not totally cut off from all connection with the past of his people—that, in fact, he claimed to be the bearer of a new testament which had been foretold and prepared for in the old. We run over his gospel in our minds, and in it we see much that assimilates it to the thought of his time and place, although he undoubtedly was a religious genius of the first order. What then, we are forced to ask, is the relation between the religious genius and traditional religion?

Or again, we bethink ourselves of the religious attitudes and beliefs of the average Christian, and compare them with the well articulated doctrines of systematic theology; we rapidly call before our minds the child repeating, "Now I lay me down to sleep" with his mother, the ascetic disciplining his body to purge his soul, the philosopher proving God, freedom, and immortality, the saint quaffing deep of the bounty of the Lord, the prophet castigating a back-sliding people, the priest making his rounds, the layman living a life in the world that is not of the world, the sinner panting for remission from his sins; we think of all the Christian churches with their rituals and ceremonials, their hymns and prayers, their holy days, their priests and other officers, their activities both to order this world aright and make

straight the way to the next. Where is one to begin who wishes to understand all this confusion and welter of agents and processes?

It seems best to start with the fact of variety and interdependence. No religion is made by any one factor working alone. Although for purposes of analysis we shall discuss the religious experience, religious organizations, and theology separately, it must be remembered that these things do not exist in isolation. They are bound together as aspects of a single tradition and life. Nearly all religions, for example, elaborate some picture of another world; but this other world in the nature of the case is always derivative—a supplement to, or extension of, the world men are living in, from which it derives not only its meaning but its content:¹

Values must be discovered and produced in a world of experience before they can be conceived or assumed to exist in a higher world. The other world must always be derived from this world; it can never be a primary concept.

This is only another way of saying that even a revelation must reveal, and that it cannot reveal if the deliverance fails to accord in some manner with the state of men's minds at the time of its enunciation. The wind must be tempered to the shorn lamb, as many Christians in recent years have recognized by speaking of a progressive revelation of God's purpose.*

Even the character of God Himself is interpreted so as to correspond fairly closely to the prevailing ideals. Thus in the middle ages He was conceived of largely in feudal terms, as the great overlord of an ascending hierarchy and the recipient of feudal dues from mankind; in the eighteenth century His nature was redefined to make it correspond more nearly to the conceptions proper to the then developing natural science and machine industry, and God came to be looked upon as the Great Artificer or the First Cause—the maker of the great world-machine; today, under the influ-

* This doctrine in itself may be regarded as a proof of the dependence of other-worldly conceptions on the cultural heritage, for it is of course a theological counterpart of the theory of evolution.

ence of evolutionary ideas, God is thought of as working out His will through time, and even as Himself developing or growing into His full powers. Some even go so far as to say that God has not yet been born, and that the whole end and purpose of history is to bring Him into being.

On the other hand it must be remembered that the gods are members of the society into which men are born. They are just as definitely parts of the social order, although they are seldom seen, as the ruler of the land, and it is taken for granted that men will maintain intercourse with them very much as they do with their fellows.

It follows that religion is not primarily an individual matter, as some have conceived. Even its more personal and interior manifestations, as for instance the experiences which lead a man to separate himself from other men and go forth alone into the wilderness to win salvation, are frequently if not always social phenomena. At certain times in the history of a faith, the desert may become studded with these hermits of the Lord. By their very numbers they bear witness to the fact that they represent a social movement. "One cannot imagine a solitary individual creating a religion for himself."² Even the form and content of our more private religious experiences are functions of our culture, as Lowie has pointed out in connection with the Crow Indians, who are required by their culture to fast in the wilderness until they have attained a vision:³

Though the visions were determined by individual psychology and by individual exigency or desire, they are very far from being wholly intelligible on that basis. Both in a general way and in detail the social atmosphere distinctive of Crow culture and specifically Crow conceptions affects the texture of the hallucinations. As for general purport, the frequency of military visions corresponds precisely to the high regard in which these Indians hold bravery, and it is only natural that those deeds conventionally rated as preëminently brave, such as the capture of a gun or the touching of an enemy, should figure conspicuously.

This influence of tribal idealism seems plausible enough. But what shall we say when one faster after another states

that he gained his end on the *fourth* day? This is of course incredible as a coincidence. Unless there is a more or less unconscious reinterpretation of the experience to fit a tribal norm, the sameness must be due to the overpowering influence of the mystic number of the Crow, which might actually lead to a postponement of the thrill sought until the fourth day. In either case cultural suggestion operates as the dynamic agent. Another significant feature is the acquisition of a sacred song. . . . When practically every visionary mentions the singing of some song, we are plainly dealing with an accepted model. The faster hears a song because *that* is an integral part of a trance; again the cultural tradition pre-determines his experience. Equally common is the faster's adoption by the apparition. . . . To turn to a particular category of revelations, those imparting invulnerability, a frequent incident is the transformation of trees or rocks into enemies, who vainly shoot at the vicariously invulnerable spirit being . . . [The faster] sees and hears not merely what any faster . . . would see and hear under like conditions of physiological exhaustion and under the urge of generally human desires, but what the social tradition of the Crow tribe imperatively suggests.

In other words, religion presents no striking differences from other social phenomena. We must not expect the religious genius entirely to transcend the world; only a richly dowered tradition is competent to give him birth. Like the poet, the highly religious man may bring much of sensitivity and insight to the world, but without a heritage to awaken and give body to his powers he stands condemned to ineffectuality, an empty shell of what he might have been.

The central fact in religion

The driving and sustaining fact in religion is the sense of need. The infant—most needy of all individuals—is not acquainted with this feeling, but an awareness of the fundamental precariousness of life is seldom absent in the adult. The notion is hardly a philosophical one, for it is too deeply seated to be cognitive or reasoned from the start. No man has lacked occasion to feel that life is a game played according to strange and hidden rules, and that at any moment he

may be called upon to take a gambler's chance for an unknown stake. It is not merely that a man may be required to pay for living with his life, at short notice and for no assigned reason; this same indefiniteness and uncertainty is woven immitigably into every human situation. Few of us acting by ourselves can stay the pain of questioning and frustration which so frequently gnaws at the human heart.

"God moves in a mysterious way, His wonders to perform"—the poet in a single line both sets the problem and gives its solution. God is the mysterious answer to the mystery which is life. Here we are—needy, impotent, often distraught, easily thrown off balance, urgently in need of assurance; we are supported, steadied, "saved," by contact with a power outside ourselves that does not waver when we waver, and in which we may find strength, sustenance, and continuity of purpose.

[The elements in the religious situation] are, in the last analysis, two, *emotion* and *mystery*. Religion, in the most general terms, is the reaction of mankind to something apprehended but not comprehended. It involves two distinct elements: the object which stimulates, and the psychic life which responds. The response in its keenest form is fear. . . . But the religious reaction is more than simple fear. It is rather the sense of acceptance than that of escape which is uppermost. . . . The essential religious emotion is reverence, which is a compound of fear and appreciation. . . . Blank fear is gone, and we are treasuring the thrills instead, in a tangle of emotions. There is a feeling toward the mystery rather than away from it, an attempt to appropriate all the emotional stimuli it can impart, to absorb its mystic power,—in short, to "worship" it. Religion, then, from savage to civilized, has this in common, that it is, on the one hand, the state of feeling awakened in a man by the sense, in and around him, of mysteries, and, on the other hand, those feelings, actions, customs, and thoughts which that sense produces, and which serve to bring him into relation to them.⁴

The religious experience, however personal and idiosyncratic it may appear, is always a social phenomenon, in that the specific form it takes in any given instance is subject to

cultural determination. It may well be (although it seems highly doubtful) that human beings of every place and condition are subject to fundamentally identical misgivings and dissatisfactions; but certainly the ways of escape differ enormously from culture to culture, and these too affect the personal religious experience. The formula for the religious experience we have outlined—*i.e.*, uncertainty and need irresolvable except by an act of faith—may be of general application, but it is in its particulars that it obtains a meaning, and these are, of course, supplied by the culture pattern. Marett is therefore quite right when he says that “a religion is the effort to face crisis, so far as that effort is organized by society in some particular way.”⁵ All aspects of religion are institutionalized, and none exist in isolation.

In the pages that follow (1) the religious experience, (2) religious organizations, and (3) theology will be discussed as ubiquitous and interdependent features of the religious situation.

(1) *The religious experience.* The religious experience supplies the vivifying personal element in religion. Shifting, wavering man looks outside himself for something he can trust, the aching need for faith and communion demands expression, and so in all ages men have attempted to prove themselves loyal to whatever vision has been their portion. Through kinship and association with the basic forces of the world, as they have experienced them, men have been saved from cosmic isolation and have been enabled to feel a little more at home in the world.

The religious experience is felt characteristically towards God, however He be conceived. In fact, the intellectual elements in the situation are relatively unimportant. “The religious experience consists, not in seeking to understand God, but in feeding upon Him, in finding strength and joy in Him.”⁶ This experience is not to be had vicariously, nor through mere entrance into the body of believers, nor yet—at least not necessarily—through vigils and preparations. It is a somewhat transitory and evanescent phenomenon even in the lives of the religiously gifted, although some

persons claim to have lived fairly continuously within its aura. The following case may be considered as typical:⁷

At times God is very real to me. At such times He seems nearer and more real than any human being could be. At other times he seems real but more or less remote. There have been times in my life, beginning in early childhood, when I have believed myself to come consciously into the presence of God. Sometimes this has occurred when I have been in great sorrow or in great fear and dread. But sometimes I have felt His Presence without any special reason for it—for example, when I have been alone out of doors or reading something that has touched me by its beauty and truth, I have felt a quick, glad sense that He was near, “closer to me than breathing, nearer than hands or feet.” Such experiences while they last make me feel that I have come to my true self. I seem to understand life better for them. They are accompanied by no emotional excitement, only by a deep peace and gladness. I have never spoken of them to anyone. These experiences are not habitual with me, that is, they do not occur very frequently. They afford me my strongest ground for belief in God.*

Not all of us have experiences of this precise type, of course, although this respondent is clearly following a well-trodden road, since students of the psychology of religion within the last generation have collected literally thousands of documents differing from this one only in details of statement. The same phrases and descriptions recur again and again in these reports, which are merely paralleled and extended by the great religious geniuses.

Contact with God is sometimes established in the religious experience in terms of extreme intimacy, while again the experience may be highly abstract. In the following passage from Saint Augustine these two seemingly contradictory attitudes appear to be joined:⁸

But what do I love, when I love Thee? not beauty of bodies, nor the brightness of the light, so gladsome to our

* J. B. Pratt, *The Religious Consciousness*, 342. Copyright, 1920, by The Macmillan Company. Reprinted by permission.

eyes, nor sweet melodies of varied songs, nor the fragrant smell of flowers, and ointments and spices, not manna and honey, not limbs acceptable to embracements of flesh. None of these I love, when I love my God; and yet I love a kind of light, and melody, and fragrance, and meat, and embracement, when I love my God, the light, melody, fragrance, meat, embracement of my inner man: where there shineth unto my soul what space cannot contain, and there soundeth, what time beareth not away, and there smelleth, what breathing disperseth not, and there tasteth, what eating diminisheth not, and there clingeth what satiety divorceth not. This is what I love, when I love my God.

Passages of this kind lend great force to the view that the religious experience as such is primarily a thing of the emotions, regardless of the glosses added to it by way of interpretation and justification. It is a way of feeling, first and foremost, and as such may be attached to practically any object, although there is always a strong inducement to translate the experience into theological language when the need of interpreting it is felt.

Thus the poet is sometimes driven by the fervor of his communion with nature to view her processes religiously:⁹

And I have felt
 A presence that disturbs me with the joy
 Of elevated thoughts; a sense sublime
 Of something far more deeply interfused
 Whose dwelling is the light of setting suns,
 And the round ocean and the living air,
 And the blue sky, and in the mind of man;
 A motion and a spirit, that impels
 All thinking things, all objects of all thought,
 And rolls through all things.

The pure and exalted ecstasy of rich contact with nature's pageantry is therefore one source of the religious experience. The acts of God can be read, by the initiated, not only in the books of man, but also in this great open book which is spread before our eyes. Sometimes the experience of nature mounts to a passionate and consuming sensuousness.¹⁰

Beauty as seen in nature or in the works of man has ever furnished one of the roads to God. The awed absorption of the esthetic experience is no doubt closely allied to the religious experience. Devotion to beauty, at any rate, can be a religion to the man who dedicates his allegiance and his loyalty to its pursuit, reverentially according it central importance in his life. Of such a mind was the poet who wrote these lines: ¹¹

A thing of beauty is a joy for ever:
Its loveliness increases; it will never
Pass into nothingness; but still will keep
A bower quiet for us, and a sleep
Full of sweet dreams, and health, and quiet breathing.
Therefore, on every morrow, are we wreathing
A flowery band to bind us to the earth,
Spite of despondence, of the inhuman dearth
Of noble natures, of the gloomy days,
Of all the unhealthy and o'erdarken'd ways
Made for our searching: yes, in spite of all,
Some shape of beauty moves away the pall
From our dark spirits.

But nature after all lies in vivid concreteness before us, and beauty can palpably fill the eye and warm the soul, so that their power to satisfy man's emotional need for something solid and certain amid the shiftings of his life is perhaps not remarkable. What shall we think, however, when we note that even the severest and least experienceable abstractions of the intellect are also capable of awakening religious emotion? The reader need not be familiar with the intricacies of the philosophical ground behind the following passage from Aristotle, to realize that his doctrine—super-tenuous as it is—evidently means much to him and awakens deep emotional reverberations of a religious nature: ¹²

And thought, in itself deals with the object which is best in itself, and the supreme with the supreme. Now it is itself that thought (or intellect) thinks, on account of its participation in the object of thought: for it becomes its own object in the act of apprehending and thinking its objects: so that

thought (intellect) and the object of thought are one and the same thing. For that which is receptive of the object of thought and can apprehend substance, is thought (or intellect). But it is in energy by possessing its object, so that this (final energy of possession) rather than that (initial receptivity) is what thought seems to have *divine*: and the energy of intellectual speculation is what is pleasantest and best.

If then in this good estate, as we are sometimes, God is always, it is wonderful, and if more so, then still more wonderful. But God is so, and life indeed belongs to God. For the energy of thought is life, and that is God's energy. We say then that God is a living being, eternal, best: so that life and an age continuous and eternal belong to God, for this is God.

The reserved fervor of Aristotle's statements concerning his God is beautifully evident, even though one fail to understand completely just to what object his emotions are attached. The boundaries of the religious experience are broad enough to include phenomena of this type no less than those more frequently met with within the circle of the devout. The God of Spinoza and Aristotle is surely as worthy of consideration as the God of Billy Sunday; and between these two extremes one would find ranged an almost overwhelming variety of deities, possessed of nearly every conceivable attribute, and alike only in that men have been led by their feelings to erect them into points of reference for the satisfaction of their emotional needs.

William James, in his classic work entitled *The Varieties of Religious Experience*, distinguishes between the religion of healthy-mindedness and the religion of the sick soul. The former type is well represented by Dr. Edward Everett Hale, the Unitarian clergyman, while an example of the latter is to be found in John Bunyan, the author of *Pilgrim's Progress*. We shall call on each to describe his condition, allowing Dr. Hale to speak first:¹³

I observe, with profound regret, the religious struggles which come into many biographies, as if almost essential to the formation of the hero. I ought to speak of these, to say that any man has an advantage, not to be estimated, who is born, as I was, into a family where the religion is simple and rational;

who is trained in the theory of such a religion, so that he never knows, for an hour, what these religious or irreligious struggles are. I always knew God loved me, and I was always grateful to him for the world he placed me in. I always liked to tell him so, and was always glad to receive his suggestions to me. . . . I can remember perfectly that when I was coming to manhood, the half-philosophical novels of the time had a deal to say about the young men and maidens who were facing the "problem of life." I had no idea whatever what the problem of life was. To live with all my might seemed to me easy; to learn where there was so much to learn seemed pleasant and almost of course; to lend a hand, if one had a chance, natural; and if one did this, why, he enjoyed life because he could not help it, and without proving to himself that he ought to enjoy it. . . . A child who is early taught that he is God's child, that he may live and move and have his being in God, and that he has, therefore, infinite strength at hand for the conquering of any difficulty, will take life more easily, and probably will make more of it, than one who is told that he is born the child of wrath and wholly incapable of good.

Dr. Hale, it appears, was by constitution of such a nature as to be incapable of appreciating the trials of poor John Bunyan, who writes thus of himself:¹⁴

Nay, thought I, now I grow worse and worse; now I am further from conversion than ever I was before. If now I should have burned at the stake, I could not believe that Christ had love for me; alas, I could neither hear him, nor see him, nor feel him, nor savor any of his things. . . . Yet all this while as to the act of sinning, I never was more tender than now; I durst not take a pin or stick, though but as big as a straw, for my conscience now was sore, and would smart at every touch; I could not tell how to speak my words, for fear I should misplace them. Oh, how gingerly did I then go, in all I did or said!

But my original and inward pollution, that was my plague and my affliction. By reason of that I was more loathsome in my own eyes than was a toad; and I thought I was so in God's eyes too. Sin and corruption, I said, would as naturally bubble out of my heart as water would bubble out of a fountain. I

could have changed heart with anybody. I thought none but the Devil himself could equal me for inward wickedness and pollution of mind. Sure, thought I, I am forsaken of God; and thus I continued a long while, even for some years together. . . .

I was both a burthen and a terror to myself; nor did I ever so know, as now, what it was to be weary of my life, and yet afraid to die. How gladly would I have been anything but myself! Anything but a man! and in any condition but my own.

There is not the slightest doubt that Bunyan's predicament was in large measure socially induced. The conventional demand for the phenomena of misery helped to create the supply. Bunyan's own testimony shows this, for his chief concern rested in the sinfulness that fell to his share as a son of Adam, rather than in the bad deeds he had actually committed. The approved plan of the revivalist has always been first to create his symptoms and then to provide the cure. By painting vivid pictures of man's estrangement from God, his utter depravity and sinfulness (not by his deeds but by nature), and his eternal damnation unless he speedily repent, the more susceptible among his hearers are thrown into a pathological panic, from which the accredited mode of exit is conversion. Only a sick soul could be converted in the traditional dramatic manner—only a person who had suffered in some measure as did Bunyan could hope to be "twice-born" in the fashion prescribed or regarded with favor by certain Christian sects. John Wesley once made a count, and found that every single one of the 652 London members of his communion had undergone the experience of instantaneous conversion in the approved fashion.¹⁵

This is not to say that there are not occasions, principally centering around crises in our lives—as when we fall in love—when human beings are suddenly snapped out of one orbit and into another. Indeed, a considerable body of evidence tends to show that adolescents, especially when sensitive and high-strung, frequently pass through a period of depression before entering into the fullness of their psychic inheritance.¹⁶ But, as Ellis points out, the problem is here really

more one of internal adjustment than of conviction of sin; the individual must come to terms with himself, and not with any hard and fast dogmas imposed from the outside:¹⁷

A "conversion" is not, as is often assumed, a turning towards a belief. More strictly, it is a turning round, a revolution; it has no primary reference to any external object. . . . To put the matter a little more precisely, the change is fundamentally a readjustment of psychic elements to each other, enabling the whole machine to work harmoniously. There is no necessary introduction of new ideas; there is much more likely to be a casting out of dead ideas which have clogged the vital process. The psychic organism—which in conventional religion is called the "soul"—had not been in harmony with itself; now it is revolving truly on its own axis, and in doing so it simultaneously finds its true orbit in the cosmic system. In becoming one with itself, it becomes one with the universe.

The problem, that is to say, is essentially one of re-orientation and reconstruction, rather than of disobedience and sinfulness. As life goes on the need for the effective organization of one's powers becomes paramount, or, as Pratt says with respect to a subject whose chief problems during this period were directly religious,^{18 *}

He was looking for—or waiting for—a view of God and of human destiny that should both satisfy the demands of an increasingly critical intellect and also appeal so strongly to his emotional nature as to rouse all his slumbering enthusiasms and loyalties. The universe seemed barren to him and life empty and worthless. What he needed chiefly was not merely an answer to intellectual puzzles, and much less a succession of pleasing and peaceful feeling states, but a new and intense value, a pearl of great price, around which he might unify his life and by the aid of which he might realize his moral self.

This need, as likewise the means offered for its satisfaction at any particular time and place, is, of course, a function of the culture complex. The definition of the religious need

* J. B. Pratt, *The Religious Consciousness*. Copyright, 1920, by The Macmillan Company. Reprinted by permission.

in terms of salvation (in the Hebraic-Christian sense) constitutes but one of the many possible answers to man's yearnings.

This section on the religious experience will be concluded by a brief reference to religious mysticism, asceticism, and altruism as aspects of the religious life. A religious mystic is a person who cultivates direct union with God, without the intermediation of sense or reason. It will be best to let two mystics describe their ecstatic state. Says Richard of St. Victor: ¹⁹

When by excess of mind we are rapt above or within ourselves into the contemplation of divine things, not only are we straightway oblivious of things external but also of all that passes in us. . . . And therefore when we return to ourselves from that state of exaltation we cannot by any means recall to our memory those things which we have erst seen above ourselves. We see, as it were, in a veil and in the midst of a cloud. . . . In wondrous fashion, remembering we do not remember, . . . seeing we do not behold : . . and understanding we do not penetrate.

St. Teresa speaks of her experiences in very much the same language:

In the orison of union the soul is fully awake as regards God, but wholly asleep as regards things of this world and in respect of herself. During the short time the union lasts, she is as it were deprived of every feeling, and even if she would she could not think of any single thing. . . .

Thus does God, when he raises a soul to union with himself, suspend the natural action of all her faculties. She neither sees, hears, nor understands, so long as she is united with God. . . . God establishes himself in the interior of this soul in such a way, that when she returns to herself, it is wholly impossible for her to doubt that she has been in God, and God in her. This truth remains so strongly impressed on her that, even though many years should pass without the condition returning, she can neither forget the favor she received, nor doubt of its reality. If you, nevertheless, ask how it is possible that the soul can see and understand that she has been in God, since during the union she has neither sight nor understand-

ing, I reply that she does not see it then, but that she sees it clearly later, after she has returned to herself, not by any vision, but by a certitude which abides with her and which God alone can give her.

These experiences, it will be noted, are nothing more than extensions, according to the canons of a particular tradition, of the fundamental belief which is the basic fact in religion. Without full warrant from sense or reason, men are impelled by the pressure of their feelings to push beyond the bare given facts, and achieve some kind of effective communion with a power outside themselves by which their own incompletenesses are remedied. The great religious mystics have usually followed the path of quasi-hypnotic absorption in their search for wholeness and unity of soul; many of them were clearly subject to pathological disorders, and were highly disoriented as respects the activities of this world: but these facts do not make their aspirations irretrievably different from our own. At the same time, it seems unwise to frame our understanding of the religious experience too largely upon the basis afforded by mystical records. Here, as elsewhere, we may expect to learn much, but not everything, from a study of abnormal instances.

The term asceticism may be taken to include almost any form of studied self-denial, from mere organic hardihood or dislike of pampering the body to pathological scourgings and mortifications of the flesh, the primary positive aim being to prepare the body for the religious experience. To a few scattering individuals, known as masochists, of whom the Blessed Henry Suso was an example, submission to pain gives an acute and voluptuous pleasure. Under the sway of religious motives, as for instance the desire to expiate sins and eradicate natural passions, the religious man may be driven to renunciation and self-punishment. Under normal conditions these acts are not engaged in for their own sakes, but in order to free the religious man from slavery to earthly needs, the flesh and the spirit being thought of as warring against each other.

Almost any difficult practice may be required for the

glory of God and the good of one's soul—celibacy, fasting, long vigils, exposure to the elements, scourging, removal from human society, poverty and want, disregard for cleanliness. In former times "the order of sanctity" was a very real thing:²⁰

Muhammedan dervishes are recognised by their appearance of untidiness and uncleanness. Among the rules laid down for Buddhist monks there is one which prescribes that their dress shall be made of rags taken from a dust or refuse heap. In the early days of Christian monasticism "the cleanliness of the body was regarded as a pollution of the soul." . . . St. Athanasius relates with enthusiasm how St. Anthony, the patriarch of monasticism, had never, to extreme old age, been guilty of washing his feet.

There was once even a sect, known as the Abecedarians, who renounced all contact with letters, so they might not be corrupted by learning. The Christian church has always, until recently, favored asceticism, although Jesus was Himself apparently not an ascetic; on one occasion He contrasted His way of life with that of John the Baptist in this regard (*Matthew*, 11: 18-19).

Ascetic practices are to be found outside of religion no less than within its confines, as for example in the athlete training for a contest or in the person who gives up something he very much desires in order to reap a deferred good later on. There is, also, such a thing as living a meager life for its own sake, exemplified by Macaulay's Puritan who denounced bear-baiting, not because it hurt the bear, but because it gave pleasure to the spectator.

Religious feeling, moreover, often generates strong impulses towards self-sacrifice and obliteration; but from this it does not follow that religion has in every instance acted as a socializing force. The saint engaged in self-obliteration can cause those about him no end of unhappiness, and people whose lives are anxiously freighted with the desire to do good are not always among the world's best citizens. The religionist can easily become engaged in a narrow, selfish scramble for salvation.

These things, however, are rather aberrations than central features of the religious situation, since religion often binds men to each other no less than to God: ²¹

If we go back as far as any analyzable records will carry us, we find that, in proportion as religion emerges from pure fetishism, it has ever combined with the apprehension of a Power conceived, at last and at best, as of a Father in heaven, that of a Bond with its brethren upon earth. Never has the sacrifice, the so-to-speak vertical relation between the individual man and God, between the worshipper and the object of his worship, been without the sacrificial meal, the communion, the so-to-speak lateral, horizontal relations between man and his fellow-man, between the worshippers one and all.

Whatever the shortcomings of individuals, it has been one of the functions of religion to bind men together and elevate the relations they sustain to each other. As St. Paul said: ²²

For as we have many members in one body, and all members have not the same office: so we, being many, are one body in Christ, and every one members one of another. . . . Recompense no man evil for evil. Provide things honest in the sight of all men. If it be possible, as much as lieth in you, live peaceably with all men. . . .

Render therefore to all their dues: tribute to whom tribute is due; custom to whom custom; fear to whom fear; honour to whom honour. Owe no man any thing, but to love one another; for he that loveth another hath fulfilled the law.

At the same time, it must be recognized that religion is by no means the only guide to moral life, and that at the present day many ethical motivations are extra-religious. "Today most men and women derive whatever strength they may have to maintain their integrity and to devote themselves to the public good from their respect and love for their family, their friends, their business associates, and the state, and from their desire for the respect and love of men, much more than from any religious conviction. It is no longer the consciousness of God, but the consciousness of Man that is the power working for righteousness." ²³ Religious leaders within the Christian tradition, recognizing this

shift in moral allegiance and realizing that it accords with many features of modern thought, have tried to reinterpret the Christian position. In the eyes of many, the new social gospel corresponds more closely to Christ's actual views than does the older individualistic, ascetic, otherworldly, renunciatory attitude:²⁴

The evangelical notion of religion as a purely personal relation between God and the soul, setting man apart from his fellows, is widely regarded as an exploded fiction. . . .

The Kingdom of God, which has usually in Christian history been identified with the heavenly kingdom lying in another world beyond the grave, or with the Christian church itself—an institution in the world but not of it—is now widely interpreted as the reign of the Christian spirit of this earth, or the control of all human relationships and institutions by the spirit of human sympathy, love and service. . . . The modern social emphasis [envisages] . . . not an isolated God, separate from the world and human life, but a God in the world, one with it, and permeating its every part. . . .

Our estimate of human character has also been socialized. We recognize that both virtue and vice are social products; that no man is solely responsible for his own sin any more than for his own goodness. . . . If there cannot be an isolated personality, or an isolated character, there cannot be isolated salvation. Nobody can be saved *from* society, he must be saved *with* it. Part of the social organism, he cannot be cut off from it, either by his sin or by his virtue, without destruction.*

(2) *Religious organizations.* No matter how personal and direct the experience may be, it is safe to say that contact with the divine is never established, except within the terms of an already existent tradition. Even the religious genius is dependent on a heritage from the past; and with respect to most of us our acquaintance with religion is almost entirely determined by the ideas and customs with which we have been indoctrinated. Men have sought communion and spiritual renovation in many ways, but never without reliance upon accepted forms and hallowed practices.

* A. C. McGiffert, *The Rise of Modern Religious Ideas*, 274-7. Copyright, 1922, by The Macmillan Company. Reprinted by permission.

The religious life is always associated with churches or associations of believers; with priest, shamans, holy men, prophets, and the like, the established intermediaries between gods and men; with rituals, ceremonies, sacred dances, or other modes of worship and formalized service; with a developed body of traditions, myths, and stories tending to support the faith; and with a more or less logically developed theology or formal enunciation of the doctrines accepted by the group. In addition, every religion has elaborated conventional behavior patterns for its members, which are followed according to one's station in the total working system. Thus every religion leads its devotees to look upon an almost incredible variety of responses as fitting and proper in predetermined situations. Some idea of the range of these prescriptions, prohibitions, and requirements in the case of a single faith at one stage in its history can be secured by a study of the early books of the Old Testament; but no set of formally enunciated commandments, obviously, could ever hope to present a full inventory of the customs and attitudes engendered by a religion in active operation. When a prophet or reformer sets out to purge a religion of its excrescences, he hardly ever has it in his mind to alter more than one or two elements in this complex aggregate of beliefs, attitudes, habits, prejudices, insights, and aspirations.

Some idea of the complexity of religious institutions can be gained by considering a few of the more important functions of the contemporary church. First and perhaps foremost, it is a place of worship; there one bows one's head before God and secures spiritual refreshment for daily life. Secondly, it is a place for religious training, wherein young and old are brought to the point of accepting the mysteries and doctrines of the communion. Again, it is a guide to life, an agent not merely of worship but for the better ordering of the worshiper's private life in the world. But it is also a corporate agency designed to serve the world, according to its lights; and finally, it is a witness and exponent of the faith to the unbelieving and lukewarm outside the fold. Each of these purposes of the church sets up a complex of relations and

subsidiary functions, and will be carried on according to well-established forms and traditions.

The following table gives some indication of the relative number of adherents for the world's principal religions. The figures are in millions:²⁵

Christians.....	564.5	34.3%
Roman Catholic.....	272.9	
Protestant.....	171.7	
Greek Orthodox.....	120.0	
Confucians and Taoists.....	300.8	18.2
Mohammedans.....	221.8	13.4
Brahmanists.....	210.5	12.8
Animists.....	158.3	9.9
Buddhists.....	138.0	8.4
Shintoists.....	25.0	1.4
Jews.....	12.2	0.7
Unclassified.....	15.3	0.9
	1646.4	

Of these groups, it is said that Shintoism is dying out, Buddhism, Judaism and Taoism are relatively quiescent, while Confucianism, Brahmanism, Mohammedanism and Christianity are increasing the number of their adherents.²⁶ Religions seem to grow best when transplanted, for Christianity centers around the western world, Buddhism is most active in China and Japan, Mohammedanism is spreading among the negro peoples of Africa, and Zoroastrianism is flourishing in India.

No satisfactory statistics are available with respect to the number of members of the different religions and sects in the United States, since there exists no common definition of membership or adherence. The Roman Catholics, for example, count every member of an adhering family, whereas other groups count only those who have been formally admitted to membership. In addition, there are undoubtedly many duplications in every enumeration; and many who are still listed on the church rolls are no longer active or interested. Using, however, the figures that are available,

and making such corrections as seem necessary, the Federal Council of the Churches of Christ in American has published the following estimate (in millions) of the religious population of the United States in 1923:²⁷

Protestant.....	79.1
Roman Catholic.....	18.3
Jewish.....	1.6
Latter-Day Saints.....	0.6
Eastern Orthodox churches.....	0.5
Others.....	0.01
Total adherents.....	100.11

One of the most amazing features of American religious life is the large number of denominations—about 175 are listed in a recent religious annual. “Whether the prodigious number is due to intensity of conviction or to a feeble development of the critical faculty, we are not prepared to say.”²⁸ It is possible to group these sects somewhat, however, and when this is done the following statistics are secured for the various Protestant groups. The figures are in millions:²⁹

Methodists (17 bodies).....	8.4
Baptists (18 bodies).....	8.2
Presbyterians (9 bodies).....	2.5
Lutherans (23 bodies).....	2.5
Disciples of Christ.....	1.4
Protestant Episcopal.....	1.1
Congregationalists.....	0.9
Others.....	3.4
Total Protestant membership.....	28 4 *

In this tabulation a number of characteristically American sects do not appear, among them the following: (a) Adventists (140,000); (b) Christian Scientist (1830 churches—publication of membership figures is forbidden); (c) Latter-Day Saints (616,000); (d) Salvation Army (50,000); (e) So-

* It will be noted that this total does not agree with the figure in the preceding table.

ciety for Ethical Culture (3,000); and a very large number of community churches, evangelistic organizations, missions, independent churches, etc.

(3) *Theology*. Men become theologians when they attempt to rationalize, explain, and justify the religious experience. As a matter of fact, the experience nearly always comes already labeled and explained—already fitted, that is to say, into an ordered system corresponding to a traditionally accepted scheme. Men do not live in a vacuum, and so they cannot help becoming acquainted with the prevailing conceptions regarding the unseen world. It is therefore not extraordinary that their seemingly private and uninfluenced contacts should fit nicely into accredited categories. We seldom interpret our experiences only *after* undergoing them, for, being acquainted with what to expect in given situations, we anticipate the run of the events, and thus actually have different things happen to us than if we had been entirely ignorant concerning what should occur. The process of adjusting data and meanings to each other is a continuous one in which data are forever becoming meanings, and meanings data.

It is not so strange, therefore, that experience and reason should so often corroborate each other when it later turns out that they were wrong. They are really not two independent witnesses, but the same one—a traditionally established preconception—testifying twice over, once in the vulgar tongue of direct experience and again in the more polished phrases of rationalization.

This is certainly the case with what might be called popular theology—with the conceptions and principles concerning the Deity and His relations to man held by the majority of human beings. It is equally the case, no doubt, with the more pretentiously developed theologies of the professional, except that these attempt to hold in solution a greater body of data drawn from the prevailing philosophical and scientific conceptions. The abstract and formal positions of the experts undoubtedly affect the ordinary religionist, but only after they have been very considerably made

over and vulgarized, as the following story told by Pratt indicates:³⁰

The notion of God which most religious men and women carry around with them when not repeating the Creed, is far less clear-cut than are the definitions of the theologians. At a prayer meeting in a small village not far from where I live, the pastor asked those present to describe their idea of God. One good and very candid deacon, when it came his turn, responded that his idea of God was "a kind of oblong blur." *

To a certain theologian, on the other hand, God is First Cause, necessary, absolute, one, spiritual, simple metaphysically, without distinctions, immutable, immense, boundless, omnipresent, eternal, of perfect intelligence and will, personal, living, self-sufficient, omniscient, previsive, omnipotent, holy, good, just, etc.³¹ To the ordinary man also, perhaps, God is all of these things—but only passively, as it were, unless by some little effort he reminds himself of the fact.

At the same time the theologian, as one writer has said, has got into the habit of paying God metaphysical compliments. And yet this same person himself continues the custom by writing of God as follows:³²

Thus as a further element in the metaphysical situation, there is required a principle of limitation. Some particular *how* is necessary, and some particularisation in the *what* of matter of fact is necessary. The only alternative to this admission, is to deny the reality of actual occasions. Their apparent irrational limitation must be taken as a proof of illusion and we must look for reality behind the scene. If we reject this alternative behind the scene, we must provide a ground for limitation which stands among the attributes of the substantial activity. This attribute provides the limitation for which no reason can be given: for all reason flows from it. God is the ultimate limitation, and His existence is the ultimate irrationality. For no reason can be given for just that

* J. B. Pratt, *The Religious Consciousness*. Copyright, 1920, by The Macmillan Company. Reprinted by permission.

limitation which it stands in His nature to impose. God is not concrete, but He is the ground for concrete actuality. *

The religious experience as such cannot be transmitted and taught; it can only be had. For it to become communicable it must be turned into words—and the only available words are likely to be those of theology. The theologian can therefore perform an inestimable service to religion, by clarifying, ordering, and relating coherently the insights of the religious life, and by placing them in the broader perspectives offered by the best established learning of the time. In doing this he renders exactly the same service (and his work should be accorded exactly the same status) as the theorist who elaborates organizing hypotheses to rationalize the findings of scientific investigation.

This task was admirably performed by the medieval theologians, and especially by St. Thomas Aquinas. The problem the Church faced then was remarkably like the problem the Church has confronted during the last seventy-five years, since the triumph of evolution. It was necessary for religion to assimilate, then as now, a great mass of new and extremely disturbing scientific data. The name of Aristotle in the 13th century symbolized the new knowledge with which religion then had to make her peace, just as the name of Darwin fills that function today. St. Thomas Aquinas was no mere time-serving hair-splitting quibbler, but a great original genius who boldly set about the task of reconciling Aristotelian science—which had quite suddenly been introduced into the western world through the expansion of the Arabs—with the prevailing religious beliefs and traditions. His effort, as A. E. Taylor points out in the following passage, was quite as radical as the later revolt in the 17th century against the then established Aristotelianism which was led by the natural scientists, and especially Galileo: ³³

The thirteenth century, like the seventeenth and the nineteenth, in their various ways, was not one of traditionalism, acquiescence in a heritage from the past, but one of restless

* A. N. Whitehead, *Science and the Modern World*, 256-7. Copyright, 1926, by The Macmillan Company. Reprinted by permission.

and audacious innovation, and to the eyes of contemporaries "Brother Thomas" was one of the most audacious of the innovators. . . . We misread the facts of history if we do not realise that the enthusiasm of the thirteenth century for Aristotle was prompted by the very same spirit as the protests of Galileo against the Aristotelian traditionalism of the universities of Northern Italy in the seventeenth century. . . .

What Thomas effected for the first time in history since the expiry of neo-Platonic learning in the sixth century was a magnificent and original synthesis of past philosophical thought. He took his materials freely from the whole record of the classic past, so far as it lay open to him, and what he constructed out of them was no chaotic eclecticism but a coherent system welded into a unity by the presence throughout its details of a few great ruling principles won by permanent hard thinking and held with the clearest consciousness of their implications. It is not true that he changed the existing philosophical tradition by dethroning one uncritically accepted authority and enthroning another. It would be much truer to say that he retained and built upon the thought which had been accessible to his predecessors, enriching and integrating it with the wealth of new matter made accessible to his own age by the recovery of Aristotle.

This is the problem which religious men of today must face. There is no eternal and inevitable conflict between religion and science; but there is today great necessity for a natural human readjustment occasioned by the birth of biological science into a religious world whose theology was cast in unbiological terms. When this readjustment shall have been completed, it is possible (though hardly very probable) that all existing faiths shall have disappeared; but religion itself is hardly in vital danger. "The true opposite of religion is not science, but that triviality which holds nothing sacred; the negation of science and of religion alike is degeneration" (Crawley).

J. Arthur Thomson presents the following very thoughtful summary of the situation: ³⁴

Men are led to religion along many pathways—from the contradictions of the moral life, from the facts of history, and

from what is experienced at the limits of practical endeavour, emotional strain, and intellectual inquiry. It is not difficult to see why the rapid development of Science should have affected, for a time of transition at least, the frequency with which men tread the last named three pathways to religion—namely, from baulked struggle, strained emotion, and baffled inquiry. The so-called “conflict between science and religion” depends in part on a clashing of particular expressions of religious beliefs with facts of science; or on a clashing of particular scientific philosophies with religious feeling, or on attempts to combine in one statement scientific and religious formulations, or on the application of psychological inquiry to the phases of religious experience, or on the contrast of the two moods.

The mystery of the world will remain even after the last fact has been learned, and the emotions of need, loneliness, and dependence cannot easily be swept from men’s hearts. They may not always be able to express themselves religiously as men do now, for faith has its seasons and its fashions even as everything else; but we must not expect them easily to be deaf to the call of their own basic needs. The darkness lies about us and within, and few men are content to live out their days inside the narrow prison cell of the indubitably true. When we cannot believe in the God that was, we believe in the God that is to be; the fluidity of the God-idea furnishes striking testimony of its importance in the life economy. When the traditional faiths no longer satisfy men, others are developed in their place. The following passage eloquently indicates that religious feeling need not disappear with the fading out of supernaturalism: ³⁵

I confess it seems strange to me as I write here, to reflect that at this moment many of my friends and most of my fellow creatures are, as far as one can judge, quite confident that they possess supernatural knowledge. As a rule, each individual belongs to some body which has received in writing the results of a divine revelation. I cannot share in any such feeling. The uncharted surrounds us on every side and we must needs have some relation towards it, a relation which will depend on the general discipline of a man’s mind and the bias of his whole character. As far as knowledge and conscious reason will go,

we should follow resolutely their austere guidance. When they cease, as cease they must, we must use as best we can those fainter powers of apprehension and surmise and sensitiveness by which, after all, most high truth has been reached as well as most high art and poetry: careful always really to seek for truth and not for our own emotional satisfaction, careful not to neglect the real needs of men and women through basing our life on dreams; and remembering above all to walk gently in a world where the lights are dim and the very stars wander.

This fine statement raises another point, with the discussion of which we shall conclude this chapter and our book. Religion, however personal it may be, has a social responsibility. It is not sufficient that the religious experience should issue in an intensely satisfying ecstasy; it must also reshape, reform, and reorient the life of the experiencer, or it is on a par with every narrow sensuous titillation and excitement. Religion must be judged in terms of its fruits in an enriched and deepened life. This is but another way of saying that the criteria of a satisfactory religious life are to be found in its harmonious correspondence to the whole sum of our activities—"The test of a religion lies in its relation to what is, as such, nonreligious, viz., to the best moral, spiritual, esthetic, and intellectual consciousness of the age as manifested in conduct, thought, ideals, and so forth."³⁶ While these standards may be regarded as external to religion, considered abstractly, they are not external to the religious man, since it is in men that ideals have their loci, and it is through the actions of men that they enter into and reshape the world.

REFERENCES

¹ Harald Höffding, quoted by J. H. Leuba, *A Psychological Study of Religion; Its origin, function, and future* (N. Y., Macmillan, 1912), 202.

² Eric S. Waterhouse, *The Philosophy of Religious Experience* (London, Epworth Press, 1923), 26.

³ R. H. Lowie, *Primitive Religion* (N. Y., Boni and Liveright, 1924), 12-14.

⁴ J. T. Shotwell, *The Religious Revolution of Today* (Boston, Houghton Mifflin, 1913), 101-103.

⁵ R. R. Marett, *Anthropology* (Home Univ. Lib.), 212.

⁶ Leuba, 30.

⁷ J. B. Pratt, *The Religious Consciousness, A psychological study* (N. Y., Macmillan, 1920), 342.

⁸ Saint Augustine, *Confessions*. Trans., by E. B. Pusey (Oxford, Parker, 1853), 186, Book X, Chap. 6.

⁹ William Wordsworth, *Lines Composed a Few Miles above Tintern Abbey*.

¹⁰ See, for example, Edna St. Vincent Millay, *God's World*; or her *Renascence*.

¹¹ John Keats, *Endymion*, opening lines.

¹² Aristotle, *Metaphysics*, Book Lambda, Chap. 10, trans. in Robert Bridges, *The Spirit of Man, An anthology in English and French made by the poet laureate in 1915* (London, Longmans, Green, 1916), No. 39.

¹³ William James, *The Varieties of Religious Experience, A study in human nature* (N. Y., Longmans, Green, 1902), 82-83.

¹⁴ James, 157-158.

¹⁵ James, 227.

¹⁶ Cf. John Stuart Mill, *Autobiography* (N. Y., Columbia Univ. Press, 1925); Henry James (ed.), *The Letters of William James* (2 vols., Boston, Houghton Mifflin, 1920); Havelock Ellis, *The Dance of Life* (Boston, Houghton Mifflin, 1923), 208-226. The case reported on pp. 160-161 of James's *Varieties of Religious Experience* is autobiographical. The quotation in our text is from Ellis, 218-219.

¹⁷ This matter is also interestingly discussed in Pratt, 122-164, esp. 148 f., where he attempts to trace the origins of the traditional view.

¹⁸ Pratt, 135.

¹⁹ Anna Robeson Burr, *Religious Confessions and Confessants, with a chapter on the history of introspection* (Boston, Houghton Mifflin, 1914), 349; James, 408-409.

²⁰ Edward Westermarck, *The Origin and Development of the Moral Ideas* (2 vols., London, Macmillan, 1908), 355.

²¹ Friedrich von Hügel, *The Mystical Element of Religion as studied in Saint Catherine of Genoa and her friends* (2 vols., London, Dent, 1923), Vol. i, 59.

²² Romans, 12:4-5, 17-18; 13:7-8.

²³ J. H. Leuba, *A Psychological Study of Religion, Its origin, function, and future* (N. Y., Macmillan, 1912), 311.

²⁴ A. C. McGiffert, *The Rise of Modern Religious Ideas* (N. Y., Macmillan, 1922), 274-277.

²⁵ Ency. Americana, Vol. 23 (1919), opp. p. 358.

²⁶ R. E. Hume, *The World's Living Religions, An historical sketch with special reference to their sacred scriptures and in comparison with Christianity* (Rev. ed., N. Y., Scribner's, 1925), 12.

²⁷ E. O. Watson (ed.), *Year Book of the Churches, 1924-5* (Balt., Stohlmann, 1924), 402-403.

²⁸ J. A. Thomson, Some impressions of America, *Aberdeen Univ. Rev.*, July, 1925, 195.

²⁹ Watson, 401.

³⁰ Pratt, 200.

³¹ See James, 439-442, for the quotation (from Newman) from which these attributes were taken.

³² A. N. Whitehead, *Science and the Modern World* (N. Y., Macmillan, 1926), 256-257.

³³ A. E. Taylor, *Saint Thomas Aquinas as a Philosopher* (Oxford, Blackwell 1924), 8-10, 15-16.

³⁴ J. A. Thomson, *Introduction to Science* (N. Y., Holt, 1911), 222-223.

³⁵ Gilbert Murray, *Four Stages of Greek Religion* (N. Y., Columbia Univ. Press, 1912), 152-153.

³⁶ S. A. Cook, Religion, in *Ency. of Relig. and Ethics*, Vol. 10, 692.

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